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Ten Year Planetary Ephemeris: 1986-1995

Fred Espenak

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National Aeronautics
and Space Administration

Scientific and Technical
Information Branch

TEN YEAR PLANETARY EPHEMERIS: 1986-1995

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Introduction

Long range planning for telescope time at major astronomical observatories or for Earth orbiting and interplanetary spacecraft missions often requires detailed solar system ephemerides. The astronomical community's chief source for such information is the Astronomical Almanac which is prepared jointly by the U. S. Naval Observatory and the Royal Greenwich Observatory. Unfortunately, the Astronomical Almanac for each year is not available any sooner than six months before the beginning of that year. This creates a void for ephemeris data needed more than a year in advance.

The Ten Year Planetary Ephemeris is an attempt to fill the void for accurate solar system ephemerides from 1986 through 1995. It is not meant to replace the Astronomical Almanac since it does not cover nearly as much material in such great detail. However, it does present accurate geocentric positional information for the Sun and planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune at five day intervals over a ten year period. The solar ephemeris in Section 1 lists both the Gregorian and Julian dates, the right ascension and declination of the Sun at 00:00 GMT (Greenwich Mean Time), the distance of the Sun from the Earth, the geocentric radial velocity, and the apparent angular diameter. The planetary ephemerides are in Section 2. For each planet, the ephemerides give the Gregorian and Julian dates, the right ascension and declination of the planet at 00:00 GMT (Greenwich Mean Time), the distance of the planet from the Earth and from the Sun, the geocentric radial velocity, apparent visual magnitude, apparent angular diameter, illumination phase and the elongation of the planet from the Sun. The radial velocity data are of special interest to high resolution spectroscopy (i.e. - infrared heterodyne spectroscopy, Fourier transform spectroscopy) and radar astronomy. This information is not included in the Astronomical Almanac but is essential to the successful planning, data reduction and analysis of such investigations.

For dark moon scheduling or calibration work, a set of tables of the phases of the Moon during this period have also been included (Section 3). Four sets of figures graphically complement the tabular ephemerides over the ten year period. For each year, they depict the apparent angular diameters (Section 4), radial velocities (Section 5), declinations (Section 6) and mean times of meridian transit (Section 7) of the seven planets and the Sun.

Finally, two technical appendices are included which cover the elementary basics of planetary orbits and the calculation of ephemerides. Although the algorithms used to generate the Ten Year Planetary Ephemeris are far more sophisticated, they do have their basis in the theory presented in Appendix A and the brief FORTRAN program 'ORREY' in Appendix B.

Accuracy

The solar ephemeris which the author developed for these predictions is based on the classic work of Newcomb [1895]. It includes all planetary perturbation terms in longitude and latitude with arguments greater than 0.01 arc-seconds. In order to determine the accuracy of this ephemeris, it has been compared with the American Ephemeris and Nautical Almanac for 1980 (now known as the Astronomical Almanac) for a series of one hundred dates during that year. The solar ephemeris agrees with the published values with a standard deviation of 0.00 seconds in right ascension and 0.05 arc-seconds in declination.

The ephemeris programs for Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune were developed primarily from algorithms appearing in Meeus [1982] and the Explanatory Supplement [1974]. They are the product of elaborate planetary theories which were published during the first quarter of the twentieth century. These theories generally describe the orbital elements of each planet as a function of time and include perturbations from the major bodies in the solar system. Although the algorithms do not include the multitude of terms found in the classic treatises, the principle perturbations have been identified which yield more than adequate accuracy for the purposes of the present work. Naturally, the effects of light-time travel, nutation and the aberration of starlight have all been included in the Ten Year Planetary Ephemeris.

To evaluate the positional accuracy of the planetary ephemerides, they have been compared with values appearing in the American Ephemeris and Nautical Almanac for 1980 (now known as the Astronomical Almanac) and the Astronomical Almanac for 1985. For Mercury, Venus, Mars and Jupiter, fifty positions were compared for each planet against published values for 1980. For Saturn, Uranus and Neptune, twenty positions were compared for each planet against published values for 1980 and 1985. The mean and standard deviations in right ascension (in seconds) and declination (in arc-seconds) from the published values for each planet are shown in Table 1.

Since no general planetary theory has been developed for Pluto and the minor planets, no mean orbital elements containing planetary perturbations are available. The future positions of these bodies are generated by means of numerical integration and such predictions are beyond the requirements and scope of this work.

Table 1 : Accuracy of Planetary Ephemerides

Planet	Mean (RA)	S.D. (RA)	Mean (Dec)	S.D. (Dec)
Sun	+0.00	0.00	-0.00	0.05
Mercury	+0.03	0.22	-0.48	1.17
Venus	+0.03	0.15	-0.01	0.80
Mars	-1.31	1.66	+3.27	5.27
Jupiter	+0.58	0.73	-0.91	1.86
Saturn	-2.45	3.75	-3.31	10.20
Uranus	+0.21	0.26	+1.49	2.00
Neptune	-0.57	0.69	+1.77	1.84

Note : Deviations in RA are in seconds.
 Deviations in Dec are in arc-seconds.

References

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TEN YEAR PLANETARY EPHEMERIS : 1986-1995

SECTION 1 : Solar Ephemeris

TEN YEAR PLANETARY EPHEMERIS : 1986-1995

SECTION 1 : Solar Ephemeris

Column	Heading	Explanation/Definition
1	DATE	Gregorian or Calendar Date. Note that ephemeris positions are for 00:00 GMT.
2	JD	Abbreviated Julian Date. To convert to full Julian Date, add 2440000.0. Julian Date is defined as the number of days elapsed since Greenwich Mean Noon on 0 January 4713 BC.
3	RA	Apparent Right Ascension (hours, minutes, seconds) of the Sun for the mean equinox of the date.
4	DEC	Apparent Declination (degrees, arc-minutes, arc-seconds) of the Sun for the mean equinox of the date.
5	DELTA	Distance of Sun from Earth in AU's. (1 AU = 1.496E+08 km)
6	RV	Geocentric Radial Velocity of Sun. (km/sec)
7	SIZE	Apparent Angular Diameter of Sun. (arc-seconds)

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
5 JAN 1986	6435.50	19 2 17.3	-22-40-15.5	0.9833	0.0366	1951.9
10 JAN 1986	6440.50	19 24 9.8	-22 -2 -2.6	0.9834	0.1687	1951.6
15 JAN 1986	6445.50	19 45 48.5	-21-13 -4.3	0.9836	0.2996	1951.2
20 JAN 1986	6450.50	20 7 10.4	-20-13-58.1	0.9840	0.4273	1950.6
25 JAN 1986	6455.50	20 28 13.4	-19 -5-19.3	0.9844	0.5507	1949.7
30 JAN 1986	6460.50	20 48 56.5	-17-47-58.7	0.9850	0.6896	1948.5
4 FEB 1986	6465.50	21 9 19.7	-16-22-40.1	0.9858	0.7839	1947.0
9 FEB 1986	6470.50	21 29 23.0	-14-50-13.9	0.9866	0.8930	1945.3
14 FEB 1986	6475.50	21 49 6.6	-13-11-33.4	0.9875	0.9949	1943.6
19 FEB 1986	6480.50	22 8 31.3	-11-27-32.3	0.9885	1.0883	1941.6
24 FEB 1986	6485.50	22 27 38.8	-9-39 -3.2	0.9896	1.1724	1939.5
1 MAR 1986	6490.50	22 46 31.1	-7-46-55.3	0.9908	1.2472	1937.2
6 MAR 1986	6495.50	23 5 11.0	-5-51-56.1	0.9920	1.3133	1934.7
11 MAR 1986	6500.50	23 23 40.6	-3-54-55.0	0.9934	1.3701	1932.1
16 MAR 1986	6505.50	23 42 2.0	-1-56-42.1	0.9947	1.4164	1929.5
21 MAR 1986	6510.50	0 0 17.5	0 1 53.9	0.9961	1.4512	1926.9
26 MAR 1986	6515.50	0 18 29.6	2 0 6.8	0.9975	1.4741	1924.2
31 MAR 1986	6520.50	0 36 41.2	3 57 14.4	0.9989	1.4861	1921.4
5 APR 1986	6525.50	0 54 55.2	5 52 35.1	1.0004	1.4879	1918.6
10 APR 1986	6530.50	1 13 13.8	7 45 24.3	1.0018	1.4794	1915.8
15 APR 1986	6535.50	1 31 39.0	9 34 57.5	1.0032	1.4600	1913.1
20 APR 1986	6540.50	1 50 12.4	11 20 30.2	1.0046	1.4290	1910.5
25 APR 1986	6545.50	2 8 55.8	13 1 21.0	1.0059	1.3869	1908.0
30 APR 1986	6550.50	2 27 51.2	14 36 51.4	1.0073	1.3350	1905.5
5 MAY 1986	6555.50	2 47 0.1	16 6 22.4	1.0085	1.2744	1903.0
10 MAY 1986	6560.50	3 6 23.2	17 29 13.6	1.0098	1.2053	1900.8
15 MAY 1986	6565.50	3 26 0.6	18 44 45.8	1.0109	1.1276	1898.7
20 MAY 1986	6570.50	3 45 51.7	19 52 21.8	1.0119	1.0409	1896.8
25 MAY 1986	6575.50	4 5 56.0	20 51 29.0	1.0128	0.9462	1895.0
30 MAY 1986	6580.50	4 26 12.9	21 41 39.1	1.0137	0.8453	1893.4
4 JUN 1986	6585.50	4 46 41.2	22 22 25.7	1.0145	0.7392	1891.9
9 JUN 1986	6590.50	5 7 18.7	22 53 26.2	1.0152	0.6287	1890.7
14 JUN 1986	6595.50	5 28 2.4	23 14 23.5	1.0157	0.5135	1889.7
19 JUN 1986	6600.50	5 48 49.3	23 25 5.8	1.0161	0.3937	1888.9
24 JUN 1986	6605.50	6 9 36.9	23 25 29.1	1.0164	0.2708	1888.3
29 JUN 1986	6610.50	6 30 22.4	23 15 34.4	1.0166	0.1462	1887.9
4 JUL 1986	6615.50	6 51 3.3	22 55 27.7	1.0167	0.0215	1887.7
9 JUL 1986	6620.50	7 11 36.9	22 25 21.9	1.0167	-0.1027	1887.8
14 JUL 1986	6625.50	7 32 0.2	21 45 35.8	1.0165	-0.2268	1888.1
19 JUL 1986	6630.50	7 52 11.0	20 56 32.9	1.0162	-0.3501	1888.7

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
24 JUL 1986	6635.50	8 12 8.1	19 58 41.3	1.0158	-0.4716	1889.4
29 JUL 1986	6640.50	8 31 50.8	18 52 30.0	1.0154	-0.5895	1890.3
3 AUG 1986	6645.50	8 51 18.9	17 38 30.9	1.0148	-0.7024	1891.4
8 AUG 1986	6650.50	9 10 32.1	16 17 20.9	1.0140	-0.8100	1892.7
13 AUG 1986	6655.50	9 29 30.3	14 49 38.7	1.0132	-0.9125	1894.3
18 AUG 1986	6660.50	9 48 14.4	13 16 3.9	1.0123	-1.0095	1896.1
23 AUG 1986	6665.50	10 6 45.6	11 37 15.3	1.0113	-1.0999	1897.9
28 AUG 1986	6670.50	10 25 5.9	9 53 49.7	1.0102	-1.1822	1899.9
2 SEP 1986	6675.50	10 43 17.4	8 6 25.7	1.0091	-1.2551	1902.1
7 SEP 1986	6680.50	11 1 21.8	6 15 45.3	1.0078	-1.3189	1904.4
12 SEP 1986	6685.50	11 19 21.0	4 22 31.0	1.0065	-1.3738	1906.9
17 SEP 1986	6690.50	11 37 17.1	2 27 25.1	1.0051	-1.4197	1909.5
22 SEP 1986	6695.50	11 55 12.8	0 31 7.6	1.0038	-1.4559	1912.1
27 SEP 1986	6700.50	12 13 11.2	-1 25 42.5	1.0024	-1.4809	1914.7
2 OCT 1986	6705.50	12 31 14.8	-3 22 23.3	1.0010	-1.4941	1917.4
7 OCT 1986	6710.50	12 49 28.0	-5 18 8.8	0.9995	-1.4962	1920.2
12 OCT 1986	6715.50	13 7 48.9	-7 12 12.3	0.9981	-1.4876	1923.0
17 OCT 1986	6720.50	13 26 19.7	-9 3 46.2	0.9966	-1.4691	1925.8
22 OCT 1986	6725.50	13 45 7.0	-10 52 5.2	0.9953	-1.4399	1928.5
27 OCT 1986	6730.50	14 4 11.3	-12 36 23.4	0.9939	-1.3991	1931.1
1 NOV 1986	6735.50	14 23 34.3	-14 15 50.9	0.9926	-1.3468	1933.6
6 NOV 1986	6740.50	14 43 17.3	-15 43 35.9	0.9913	-1.2840	1936.1
11 NOV 1986	6745.50	15 3 20.7	-17 16 45.8	0.9901	-1.2121	1938.5
16 NOV 1986	6750.50	15 23 44.8	-18 36 29.8	0.9890	-1.1318	1940.7
21 NOV 1986	6755.50	15 44 29.9	-19 48 0.9	0.9879	-1.0428	1942.8
26 NOV 1986	6760.50	16 5 35.5	-20 50 33.8	0.9870	-0.9450	1944.6
1 DEC 1986	6765.50	16 27 0.1	-21 43 24.3	0.9861	-0.8390	1946.3
6 DEC 1986	6770.50	16 48 41.2	-22 25 53.1	0.9854	-0.7262	1947.8
11 DEC 1986	6775.50	17 10 35.4	-22 57 26.5	0.9847	-0.6085	1949.1
16 DEC 1986	6780.50	17 32 39.1	-23 17 39.6	0.9841	-0.4869	1950.2
21 DEC 1986	6785.50	17 54 48.9	-23 26 16.4	0.9838	-0.3614	1951.0
26 DEC 1986	6790.50	18 17 0.8	-23 23 8.3	0.9835	-0.2325	1951.5
31 DEC 1986	6795.50	18 39 10.9	-23 8 15.5	0.9834	-0.1007	1951.8

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
5 JAN 1987	6800.50	19 1	14.4	-22-41-49.1	0.9833	0.0319	1951.9
10 JAN 1987	6805.50	19 23	7.1	-22 -4 -8.6	0.9834	0.1633	1951.8
15 JAN 1987	6810.50	19 44	45.7	-21-15-42.3	0.9836	0.2928	1951.4
20 JAN 1987	6815.50	20 6	8.0	-20-17 -4.3	0.9839	0.4198	1950.6
25 JAN 1987	6820.50	20 27	12.3	-19 -8-53.0	0.9844	0.5440	1949.8
30 JAN 1987	6825.50	20 47	57.3	-17-51-53.2	0.9850	0.6650	1948.5
4 FEB 1987	6830.50	21 8	21.9	-16-26-54.7	0.9857	0.7805	1947.1
9 FEB 1987	6835.50	21 28	25.7	-14-54-49.1	0.9865	0.8891	1945.6
14 FEB 1987	6840.50	21 48	9.6	-13-16-28.9	0.9874	0.9898	1943.8
19 FEB 1987	6845.50	22 7	34.9	-11-32-44.1	0.9884	1.0829	1941.8
24 FEB 1987	6850.50	22 26	43.6	-9-44-24.0	0.9895	1.1685	1939.6
1 MAR 1987	6855.50	22 45	37.5	-7-52-20.6	0.9907	1.2457	1937.3
6 MAR 1987	6860.50	23 4	18.2	-5-57-26.2	0.9919	1.3131	1934.9
11 MAR 1987	6865.50	23 22	47.9	-4 0-31.7	0.9932	1.3696	1932.4
16 MAR 1987	6870.50	23 41	9.0	-2 -2-25.2	0.9946	1.4149	1929.8
21 MAR 1987	6875.50	23 59	24.5	0 -3-50.8	0.9960	1.4498	1927.1
26 MAR 1987	6880.50	0 17	37.3	1 54 27.9	0.9974	1.4745	1924.3
31 MAR 1987	6885.50	0 35	49.6	3 51 44.7	0.9988	1.4888	1921.5
5 APR 1987	6890.50	0 54	3.8	5 47 13.4	1.0003	1.4919	1918.8
10 APR 1987	6895.50	1 12	21.8	7 40 8.6	1.0017	1.4831	1916.1
15 APR 1987	6900.50	1 30	45.9	9 29 48.0	1.0031	1.4626	1913.4
20 APR 1987	6905.50	1 49	18.7	11 15 32.4	1.0045	1.4319	1910.7
25 APR 1987	6910.50	2 8	2.2	12 56 41.0	1.0059	1.3916	1908.1
30 APR 1987	6915.50	2 26	57.8	14 32 31.3	1.0072	1.3419	1905.6
5 MAY 1987	6920.50	2 46	6.3	16 2 21.3	1.0084	1.2823	1903.2
10 MAY 1987	6925.50	3 5	28.3	17 25 30.1	1.0096	1.2126	1901.0
15 MAY 1987	6930.50	3 25	4.2	18 41 20.9	1.0107	1.1337	1898.9
20 MAY 1987	6935.50	3 44	54.5	19 49 20.1	1.0118	1.0472	1896.9
25 MAY 1987	6940.50	4 4	58.9	20 48 54.1	1.0128	0.9542	1895.0
30 MAY 1987	6945.50	4 25	16.1	21 39 31.7	1.0137	0.8551	1893.4
4 JUN 1987	6950.50	4 45	44.0	22 20 45.5	1.0144	0.7496	1892.0
9 JUN 1987	6955.50	5 6	20.4	22 52 12.8	1.0151	0.6379	1890.8
14 JUN 1987	6960.50	5 27	3.1	23 13 37.8	1.0156	0.5214	1889.8
19 JUN 1987	6965.50	5 47	49.9	23 24 49.8	1.0161	0.4016	1888.9
24 JUN 1987	6970.50	6 8	39.0	23 25 42.3	1.0165	0.2800	1888.2
29 JUN 1987	6975.50	6 29	24.4	23 16 16.1	1.0167	0.1570	1887.8
4 JUL 1987	6980.50	6 50	5.7	22 56 37.9	1.0167	0.0322	1887.7
9 JUL 1987	6985.50	7 10	38.8	22 27 0.7	1.0167	-0.0937	1887.8
14 JUL 1987	6990.50	7 31	1.9	21 47 43.2	1.0165	-0.2193	1888.1
19 JUL 1987	6995.50	7 51	13.2	20 59 6.9	1.0163	-0.3430	1888.5

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
24 JUL 1987	7000.50	8 11 11.8	20	1 37.8	1.0159	-0.4633	1889.2
29 JUL 1987	7005.50	8 30 55.6	18 55 47.4		1.0154	-0.5801	1890.1
3 AUG 1987	7010.50	8 50 24.2	17 42 10.2		1.0148	-0.6938	1891.3
8 AUG 1987	7015.50	9 9 37.3	16 21 22.9		1.0141	-0.8031	1892.7
13 AUG 1987	7020.50	9 28 35.5	14 54 2.2		1.0133	-0.9075	1894.2
18 AUG 1987	7025.50	9 47 20.2	13 20 43.9		1.0124	-1.0049	1895.6
23 AUG 1987	7030.50	10 5 52.6	11 42 6.1		1.0114	-1.0943	1897.7
28 AUG 1987	7035.50	10 24 13.9	9 58 50.1		1.0103	-1.1759	1899.7
2 SEP 1987	7040.50	10 42 25.6	8 11 37.6		1.0091	-1.2498	1902.0
7 SEP 1987	7045.50	11 0 29.6	6 21 10.1		1.0079	-1.3157	1904.3
12 SEP 1987	7050.50	11 18 28.3	4 28 6.5		1.0068	-1.3725	1906.8
17 SEP 1987	7055.50	11 36 24.5	2 33 4.6		1.0053	-1.4188	1909.2
22 SEP 1987	7060.50	11 54 20.9	0 36 45.5		1.0039	-1.4639	1911.8
27 SEP 1987	7065.50	12 12 19.5	-1 20 -6.9		1.0025	-1.4784	1914.5
2 OCT 1987	7070.50	12 30 22.6	-3 10 -47.9		1.0010	-1.4927	1917.3
7 OCT 1987	7075.50	12 48 32.7	-5 12 -32.5		0.9998	-1.4970	1920.1
12 OCT 1987	7080.50	13 6 52.5	-7 -6 -38.4		0.9982	-1.4903	1922.9
17 OCT 1987	7085.50	13 25 24.8	-8 -58 -22.1		0.9968	-1.4718	1925.5
22 OCT 1987	7090.50	13 44 12.1	-10 -48 -55.8		0.9954	-1.4415	1928.2
27 OCT 1987	7095.50	14 3 16.0	-12 -31 -29.3		0.9940	-1.4001	1930.9
1 NOV 1987	7100.50	14 22 37.8	-14 -11 -11.0		0.9926	-1.3489	1933.6
6 NOV 1987	7105.50	14 42 19.0	-15 -45 -10.0		0.9913	-1.2884	1936.1
11 NOV 1987	7110.50	15 2 20.9	-17 -12 -38.2		0.9901	-1.2179	1938.4
16 NOV 1987	7115.50	15 22 44.4	-18 -32 -46.7		0.9890	-1.1373	1940.6
21 NOV 1987	7120.50	15 43 29.3	-19 -44 -45.6		0.9880	-1.0471	1942.6
26 NOV 1987	7125.50	16 4 34.4	-20 -47 -46.9		0.9870	-0.9486	1944.5
1 DEC 1987	7130.50	16 25 57.9	-21 -41 -5.7		0.9861	-0.8436	1946.3
6 DEC 1987	7135.50	16 47 37.4	-22 -24 -3.5		0.9853	-0.7328	1947.8
11 DEC 1987	7140.50	17 9 30.6	-22 -56 -9.1		0.9847	-0.6162	1949.1
16 DEC 1987	7145.50	17 31 34.3	-23 -10 -56.6		0.9842	-0.4939	1950.1
21 DEC 1987	7150.50	17 53 44.8	-23 -26 -7.5		0.9838	-0.3669	1950.9
26 DEC 1987	7155.50	18 15 57.2	-23 -23 -33.3		0.9835	-0.2371	1951.5
31 DEC 1987	7160.50	18 38 7.0	-23 -9 -14.5		0.9833	-0.1063	1951.9

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
5 JAN 1988	7165.50	19 0 10.1	-22-43-22.0	0.9833	0.0245	1952.0
10 JAN 1988	7170.50	19 22 3.0	-22 -6-14.8	0.9834	0.1552	1951.8
15 JAN 1988	7175.50	19 43 42.9	-21-18-18.2	0.9836	0.2856	1951.3
20 JAN 1988	7180.50	20 5 6.9	-20-20 -6.4	0.9840	0.4145	1950.6
25 JAN 1988	7185.50	20 26 12.4	-19-12-20.8	0.9844	0.5397	1949.7
30 JAN 1988	7190.50	20 46 57.8	-17-55-47.0	0.9850	0.6598	1948.6
4 FEB 1988	7195.50	21 7 22.6	-16-31-13.7	0.9857	0.7739	1947.2
9 FEB 1988	7200.50	21 27 27.1	-14-59-29.6	0.9865	0.8821	1946.6
14 FEB 1988	7205.50	21 47 12.4	-13-21-24.0	0.9874	0.9843	1943.8
19 FEB 1988	7210.50	22 6 39.3	-11-37-49.8	0.9884	1.0794	1941.8
24 FEB 1988	7215.50	22 25 48.9	-9-49-40.9	0.9895	1.1658	1939.7
29 FEB 1988	7220.50	22 44 42.9	-7-57-50.1	0.9906	1.2422	1937.5
5 MAR 1988	7225.50	23 3 23.5	-6 -3 -7.5	0.9919	1.3084	1935.1
10 MAR 1988	7230.50	23 21 53.4	-4 -6-19.6	0.9932	1.3648	1932.5
15 MAR 1988	7235.50	23 40 15.4	-2 -8-12.3	0.9946	1.4118	1929.8
20 MAR 1988	7240.50	23 58 31.8	0 -9-34.0	0.9959	1.4487	1927.1
25 MAR 1988	7245.50	0 16 44.7	1 48 47.1	0.9973	1.4743	1924.4
30 MAR 1988	7250.50	0 34 58.5	3 46 4.4	0.9987	1.4878	1921.7
4 APR 1988	7255.50	0 53 9.7	5 41 34.6	1.0002	1.4897	1919.0
9 APR 1988	7260.50	1 11 27.3	7 34 37.4	1.0016	1.4811	1916.2
14 APR 1988	7265.50	1 29 51.6	9 24 30.9	1.0031	1.4625	1913.4
19 APR 1988	7270.50	1 48 24.6	11 10 31.2	1.0045	1.4338	1910.8
24 APR 1988	7275.50	2 7 7.6	12 51 54.5	1.0058	1.3942	1908.2
29 APR 1988	7280.50	2 26 2.0	14 27 58.2	1.0071	1.3435	1905.8
4 MAY 1988	7285.50	2 45 9.1	15 58 3.1	1.0084	1.2828	1903.4
9 MAY 1988	7290.50	3 4 30.4	17 21 32.5	1.0096	1.2135	1901.1
14 MAY 1988	7295.50	3 24 6.3	18 37 48.4	1.0107	1.1364	1898.9
19 MAY 1988	7300.50	3 43 56.6	19 46 13.5	1.0118	1.0518	1896.9
24 MAY 1988	7305.50	4 4 0.4	20 46 13.0	1.0127	0.9592	1895.2
29 MAY 1988	7310.50	4 24 16.2	21 37 15.6	1.0136	0.8590	1893.6
3 JUN 1988	7315.50	4 44 43.0	22 18 56.0	1.0144	0.7524	1892.1
8 JUN 1988	7320.50	5 5 19.1	22 50 53.1	1.0151	0.6411	1890.6
13 JUN 1988	7325.50	5 26 2.3	23 12 48.7	1.0156	0.5263	1889.7
18 JUN 1988	7330.50	5 46 49.7	23 24 30.9	1.0161	0.4082	1888.9
23 JUN 1988	7335.50	6 7 37.8	23 25 53.6	1.0164	0.2866	1888.3
28 JUN 1988	7340.50	6 28 23.6	23 16 57.3	1.0166	0.1621	1888.0
3 JUL 1988	7345.50	6 49 4.6	22 57 49.5	1.0167	0.0363	1887.8
8 JUL 1988	7350.50	7 9 38.3	22 28 41.5	1.0167	-0.0893	1887.8
13 JUL 1988	7355.50	7 30 2.8	21 49 50.0	1.0166	-0.2133	1888.0
18 JUL 1988	7360.50	7 50 15.4	21 1 38.6	1.0163	-0.3357	1888.5

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
23 JUL 1988	7365.50	8 10 14.3	20 4 34.8	1.0159	-0.4565	1889.2
28 JUL 1988	7370.50	8 29 58.3	18 59 10.0	1.0154	-0.5749	1890.2
2 AUG 1988	7375.50	8 49 27.2	17 45 57.1	1.0148	-0.6897	1891.3
7 AUG 1988	7380.50	9 8 41.2	16 25 29.1	1.0141	-0.7990	1892.6
12 AUG 1988	7385.50	9 27 41.0	14 58 22.9	1.0133	-0.9018	1894.0
17 AUG 1988	7390.50	9 46 28.8	13 25 18.1	1.0124	-0.9984	1895.8
22 AUG 1988	7395.50	10 4 59.6	11 46 55.5	1.0114	-1.0886	1897.7
27 AUG 1988	7400.50	10 23 20.8	10 3 55.6	1.0103	-1.1720	1899.8
1 SEP 1988	7405.50	10 41 32.4	8 16 56.7	1.0091	-1.2474	1901.9
6 SEP 1988	7410.50	10 59 37.0	6 26 36.0	1.0079	-1.3130	1904.2
11 SEP 1988	7415.50	11 17 36.7	4 33 34.2	1.0067	-1.3685	1906.6
16 SEP 1988	7420.50	11 35 33.5	2 38 34.1	1.0053	-1.4142	1909.1
21 SEP 1988	7425.50	11 53 29.6	0 42 19.0	1.0039	-1.4503	1911.8
26 SEP 1988	7430.50	12 11 27.4	-1-14-28.5	1.0025	-1.4769	1914.5
1 OCT 1988	7435.50	12 29 29.8	-3-11-8.3	1.0011	-1.4927	1917.2
6 OCT 1988	7440.50	12 47 39.8	-5-6-59.0	0.9997	-1.4988	1919.9
11 OCT 1988	7445.50	13 5 59.9	-7-1-15.3	0.9983	-1.4887	1922.7
16 OCT 1988	7450.50	13 24 32.0	-8-53-9.3	0.9968	-1.4698	1925.4
21 OCT 1988	7455.50	13 43 18.3	-10-41-51.6	0.9954	-1.4406	1928.2
26 OCT 1988	7460.50	14 2 20.6	-12-28-33.6	0.9940	-1.4014	1930.9
31 OCT 1988	7465.50	14 21 41.2	-14-6-28.5	0.9927	-1.3515	1933.4
5 NOV 1988	7470.50	14 41 21.9	-15-40-47.4	0.9914	-1.2904	1935.9
10 NOV 1988	7475.50	15 1 23.6	-17-8-38.7	0.9902	-1.2187	1938.2
15 NOV 1988	7480.50	15 21 48.5	-18-29-10.6	0.9891	-1.1376	1940.5
20 NOV 1988	7485.50	15 42 30.0	-19-41-32.5	0.9880	-1.0487	1942.6
25 NOV 1988	7490.50	16 3 33.4	-20-44-57.7	0.9870	-0.9523	1944.6
30 NOV 1988	7495.50	16 24 55.7	-21-38-44.6	0.9862	-0.8482	1946.2
5 DEC 1988	7500.50	16 46 35.0	-22-22-14.1	0.9854	-0.7367	1947.7
10 DEC 1988	7505.50	17 8 28.5	-22-54-52.3	0.9848	-0.6186	1949.0
15 DEC 1988	7510.50	17 30 32.2	-23-16-12.5	0.9842	-0.4968	1950.1
20 DEC 1988	7515.50	17 52 41.8	-23-25-50.3	0.9838	-0.3701	1951.0
25 DEC 1988	7520.50	18 14 53.4	-23-23-55.5	0.9835	-0.2420	1951.6
30 DEC 1988	7525.50	18 37 3.1	-23-10-10.8	0.9833	-0.1119	1951.8

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
4 JAN 1989	7530.50	18 59	7.1	-22-44-50.5	0.9833	0.0200	1951.9
9 JAN 1989	7535.50	19 21	1.5	-22-8-13.2	0.9834	0.1525	1951.7
14 JAN 1989	7540.50	19 42	42.2	-21-20-46.3	0.9836	0.2833	1951.3
19 JAN 1989	7545.50	20 4	6.4	-20-23-4.2	0.9839	0.4109	1950.7
24 JAN 1989	7550.50	20 25	12.0	-19-15-47.7	0.9844	0.5346	1949.8
29 JAN 1989	7555.50	20 45	58.1	-17-59-39.5	0.9850	0.6544	1948.6
3 FEB 1989	7560.50	21 6	24.4	-16-35-25.9	0.9857	0.7699	1947.1
8 FEB 1989	7565.50	21 26	30.6	-15-3-58.0	0.9865	0.8799	1945.6
13 FEB 1989	7570.50	21 46	16.8	-13-26-9.2	0.9874	0.9826	1943.8
18 FEB 1989	7575.50	22 5	43.9	-11-42-52.9	0.9884	1.0766	1941.9
23 FEB 1989	7580.50	22 24	53.5	-9-55-0.7	0.9894	1.1616	1939.8
28 FEB 1989	7585.50	22 43	48.0	-8-3-20.9	0.9906	1.2380	1937.5
5 MAR 1989	7590.50	23 2	29.7	-6-8-42.3	0.9919	1.3059	1935.0
10 MAR 1989	7595.50	23 21	0.7	-4-11-55.8	0.9932	1.3641	1932.5
15 MAR 1989	7600.50	23 39	22.9	-2-13-51.5	0.9945	1.4116	1929.9
20 MAR 1989	7605.50	23 57	38.8	0-15-18.1	0.9959	1.4473	1927.3
25 MAR 1989	7610.50	0 15	51.1	1 42 59.7	0.9973	1.4716	1924.6
30 MAR 1989	7615.50	0 34	2.8	3 40 20.3	0.9987	1.4855	1921.8
4 APR 1989	7620.50	0 52	16.5	5 36 0.2	1.0002	1.4893	1918.9
9 APR 1989	7625.50	1 10	34.3	7 29 14.3	1.0016	1.4825	1916.2
14 APR 1989	7630.50	1 28	58.2	9 19 17.4	1.0030	1.4643	1913.6
19 APR 1989	7635.50	1 47	30.0	11 5 25.8	1.0044	1.4343	1911.0
24 APR 1989	7640.50	2 6	11.7	12 46 59.5	1.0057	1.3936	1908.4
29 APR 1989	7645.50	2 25	5.5	14 23 20.0	1.0071	1.3436	1905.8
4 MAY 1989	7650.50	2 44	12.7	15 53 46.6	1.0084	1.2848	1903.4
9 MAY 1989	7655.50	3 3	33.8	17 17 38.5	1.0096	1.2172	1901.1
14 MAY 1989	7660.50	3 23	8.9	18 34 16.9	1.0107	1.1403	1899.1
19 MAY 1989	7665.50	3 42	57.8	19 43 2.1	1.0117	1.0544	1897.1
24 MAY 1989	7670.50	4 3	0.2	20 43 25.0	1.0127	0.9609	1895.3
29 MAY 1989	7675.50	4 23	15.7	21 34 55.5	1.0136	0.8613	1893.6
3 JUN 1989	7680.50	4 43	42.7	22 17 5.7	1.0144	0.7566	1892.1
8 JUN 1989	7685.50	5 4	19.1	22 49 32.5	1.0150	0.6469	1890.9
13 JUN 1989	7690.50	5 25	1.9	23 11 57.6	1.0156	0.5320	1889.9
18 JUN 1989	7695.50	5 45	48.4	23 24 9.2	1.0160	0.4125	1889.1
23 JUN 1989	7700.50	6 6	36.0	23 26 2.4	1.0163	0.2900	1888.4
28 JUN 1989	7705.50	6 27	22.3	23 17 36.8	1.0166	0.1662	1888.0
3 JUL 1989	7710.50	6 48	4.4	22 58 57.6	1.0167	0.0422	1887.7
8 JUL 1989	7715.50	7 8	39.3	22 30 17.4	1.0167	-0.0821	1887.8
13 JUL 1989	7720.50	7 29	4.0	21 51 54.1	1.0165	-0.2067	1888.1
18 JUL 1989	7725.50	7 49	16.5	21 4 10.7	1.0162	-0.3305	1888.6

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
23 JUL 1989	7730.50	8 9 15.7	20 7 33.9	1.0159	-0.4523	1889.3
28 JUL 1989	7735.50	8 29 0.8	19 2 31.8	1.0154	-0.5702	1890.1
2 AUG 1989	7740.50	8 48 31.2	17 49 37.4	1.0149	-0.6833	1891.2
7 AUG 1989	7745.50	9 7 46.5	16 29 27.5	1.0141	-0.7918	1892.5
12 AUG 1989	7750.50	9 26 46.7	15 2 40.6	1.0133	-0.8958	1894.1
17 AUG 1989	7755.50	9 45 32.5	13 29 55.6	1.0124	-0.9939	1895.8
22 AUG 1989	7760.50	10 4 5.5	11 51 50.0	1.0114	-1.0863	1897.6
27 AUG 1989	7765.50	10 22 27.6	10 9 0.6	1.0104	-1.1682	1899.6
1 SEP 1989	7770.50	10 40 40.4	8 22 7.8	1.0092	-1.2422	1901.7
6 SEP 1989	7775.50	10 58 45.6	6 31 53.7	1.0080	-1.3075	1904.1
11 SEP 1989	7780.50	11 16 45.2	4 39 0.8	1.0067	-1.3643	1906.6
16 SEP 1989	7785.50	11 34 41.4	2 44 10.1	1.0053	-1.4121	1909.1
21 SEP 1989	7790.50	11 52 37.1	0 48 0.3	1.0040	-1.4498	1911.7
26 SEP 1989	7795.50	12 10 35.1	-1 -8-49.1	1.0026	-1.4757	1914.3
1 OCT 1989	7800.50	12 28 38.0	-3 -5-34.5	1.0012	-1.4904	1917.0
6 OCT 1989	7805.50	12 46 47.8	-6 -1-30.1	0.9998	-1.4943	1919.8
11 OCT 1989	7810.50	13 5 6.9	-8-55-49.3	0.9983	-1.4880	1922.6
16 OCT 1989	7815.50	13 23 37.7	-8-47-46.3	0.9969	-1.4714	1925.4
21 OCT 1989	7820.50	13 42 22.9	-10-36-37.0	0.9955	-1.4435	1928.0
26 OCT 1989	7825.50	14 1 24.8	-12-21-34.1	0.9941	-1.4038	1930.6
31 OCT 1989	7830.50	14 20 45.2	-14 -1-47.3	0.9928	-1.3529	1933.2
5 NOV 1989	7835.50	14 40 25.1	-15-38-24.3	0.9915	-1.2918	1935.7
10 NOV 1989	7840.50	15 0 25.2	-17 -4-33.0	0.9903	-1.2218	1938.2
15 NOV 1989	7845.50	15 20 46.2	-18-25-23.8	0.9891	-1.1430	1940.4
20 NOV 1989	7850.50	15 41 28.4	-19-38 -9.7	0.9881	-1.0550	1942.5
25 NOV 1989	7855.50	16 2 31.4	-20-42 -3.7	0.9871	-0.9580	1944.3
30 NOV 1989	7860.50	16 23 53.6	-21-36-21.2	0.9863	-0.8527	1946.0
5 DEC 1989	7865.50	16 45 32.3	-22-20-21.7	0.9855	-0.7411	1947.6
10 DEC 1989	7870.50	17 7 24.5	-22-53-31.0	0.9848	-0.6247	1949.0
15 DEC 1989	7875.50	17 29 27.0	-23-15-23.7	0.9842	-0.5038	1950.1
20 DEC 1989	7880.50	17 51 36.2	-23-25-42.1	0.9838	-0.3786	1950.9
25 DEC 1989	7885.50	18 13 48.4	-23-24-15.8	0.9836	-0.2495	1951.4
30 DEC 1989	7890.50	18 35 59.1	-23-11 -4.5	0.9834	-0.1178	1951.7

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
4 JAN 1990	7895.50	18 58 3.6	-22-46-17.5	0.9833	0.0143	1951.9
9 JAN 1990	7900.50	19 19 57.8	-22-10-13.3	0.9834	0.1454	1951.8
14 JAN 1990	7905.50	19 41 38.5	-21-23-19.1	0.9836	0.2748	1951.4
19 JAN 1990	7910.50	20 3 3.4	-20-26 -7.0	0.9839	0.4024	1950.7
24 JAN 1990	7915.50	20 24 10.7	-19-19-15.3	0.9844	0.5278	1949.7
29 JAN 1990	7920.50	20 44 58.6	-18 -3-29.2	0.9850	0.6494	1948.6
3 FEB 1990	7925.50	21 5 25.9	-16-39-37.8	0.9856	0.7653	1947.3
8 FEB 1990	7930.50	21 25 32.4	-15 -8-32.5	0.9864	0.8743	1945.8
13 FEB 1990	7935.50	21 45 18.9	-13-31 -4.5	0.9873	0.9768	1944.0
18 FEB 1990	7940.50	22 4 46.9	-11-48 -3.1	0.9883	1.0703	1942.0
23 FEB 1990	7945.50	22 23 58.1	-10 -0-19.1	0.9894	1.1575	1939.8
28 FEB 1990	7950.50	22 42 54.0	-8 -8-45.4	0.9906	1.2359	1937.5
5 MAR 1990	7955.50	23 1 30.3	-6-14-14.4	0.9918	1.3042	1935.2
10 MAR 1990	7960.50	23 20 7.1	-4-17-36.7	0.9930	1.3616	1932.7
15 MAR 1990	7965.50	23 38 29.2	-2-19-39.1	0.9944	1.4082	1930.1
20 MAR 1990	7970.50	23 56 45.4	0-21 -5.4	0.9958	1.4448	1927.4
25 MAR 1990	7975.50	0 14 58.6	1 37 19.0	0.9972	1.4715	1924.6
30 MAR 1990	7980.50	0 33 10.8	3 34 47.0	0.9986	1.4873	1921.9
4 APR 1990	7985.50	0 51 24.4	5 30 32.4	1.0001	1.4916	1919.2
9 APR 1990	7990.50	1 9 41.3	7 23 50.4	1.0015	1.4838	1916.5
14 APR 1990	7995.50	1 28 4.3	9 14 0.2	1.0029	1.4648	1913.8
19 APR 1990	8000.50	1 46 35.9	11 0 22.2	1.0043	1.4360	1911.1
24 APR 1990	8005.50	2 5 17.9	12 42 14.2	1.0057	1.3976	1908.4
29 APR 1990	8010.50	2 24 11.7	14 18 53.2	1.0070	1.3494	1906.0
4 MAY 1990	8015.50	2 43 18.1	15 49 38.9	1.0082	1.2907	1903.6
9 MAY 1990	8020.50	3 2 37.8	17 13 45.2	1.0094	1.2220	1901.4
14 MAY 1990	8025.50	3 22 11.8	18 30 42.2	1.0106	1.1445	1899.2
19 MAY 1990	8030.50	3 42 0.3	19 39 53.0	1.0117	1.0597	1897.2
24 MAY 1990	8035.50	4 2 3.0	20 40 43.1	1.0126	0.9682	1895.3
29 MAY 1990	8040.50	4 22 18.5	21 32 40.7	1.0135	0.8703	1893.7
3 JUN 1990	8045.50	4 42 44.8	22 15 17.4	1.0143	0.7653	1892.3
8 JUN 1990	8050.50	5 3 20.0	22 48 10.8	1.0149	0.6543	1891.1
13 JUN 1990	8055.50	5 24 2.1	23 11 4.4	1.0155	0.5387	1890.0
18 JUN 1990	8060.50	5 44 48.8	23 23 46.0	1.0160	0.4202	1889.1
23 JUN 1990	8065.50	6 5 37.4	23 26 8.4	1.0164	0.2996	1888.4
28 JUN 1990	8070.50	6 26 24.3	23 18 11.6	1.0166	0.1770	1888.0
3 JUL 1990	8075.50	6 47 6.4	23 0 1.2	1.0166	0.0522	1887.9
8 JUL 1990	8080.50	7 7 40.8	22 31 50.0	1.0166	-0.0736	1887.9
13 JUL 1990	8085.50	7 28 5.7	21 53 54.9	1.0165	-0.1990	1888.1
18 JUL 1990	8090.50	7 48 19.2	21 6 36.8	1.0163	-0.3221	1888.5

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
23 JUL 1990	8095.50	8 8	19.9	20 10 21.9	1.0159	-0.4422	1889.2
28 JUL 1990	8100.50	8 28	6.1	19 5 41.6	1.0155	-0.5594	1890.1
2 AUG 1990	8105.50	8 47	36.8	17 53 9.9	1.0148	-0.6737	1891.2
7 AUG 1990	8110.50	9 6	52.1	16 33 23.0	1.0141	-0.7840	1892.6
12 AUG 1990	8115.50	9 25	52.6	15 6 58.1	1.0134	-0.8888	1894.0
17 AUG 1990	8120.50	9 44	39.5	13 34 25.1	1.0125	-0.9884	1895.6
22 AUG 1990	8125.50	10 3	13.8	11 58 29.9	1.0115	-1.0765	1897.5
27 AUG 1990	8130.50	10 21	36.8	10 13 51.7	1.0104	-1.1593	1899.5
1 SEP 1990	8135.50	10 39	49.4	8 27 12.1	1.0092	-1.2348	1901.7
6 SEP 1990	8140.50	10 57	54.2	6 37 11.5	1.0080	-1.3022	1904.0
11 SEP 1990	8145.50	11 15	53.6	4 44 27.5	1.0068	-1.3602	1906.4
16 SEP 1990	8150.50	11 33	50.3	2 49 38.9	1.0055	-1.4074	1908.8
21 SEP 1990	8155.50	11 51	46.6	0 53 28.0	1.0041	-1.4440	1911.4
26 SEP 1990	8160.50	12 9	44.7	-1 -3-21.2	1.0027	-1.4703	1914.1
1 OCT 1990	8165.50	12 27	46.7	-3 0 -4.1	1.0012	-1.4868	1916.9
6 OCT 1990	8170.50	12 45	55.4	-4-55-57.8	0.9998	-1.4931	1919.7
11 OCT 1990	8175.50	13 4	13.7	-6-50-20.7	0.9984	-1.4879	1922.4
16 OCT 1990	8180.50	13 22	44.3	-8-42-28.2	0.9970	-1.4708	1925.1
21 OCT 1990	8185.50	13 41	29.3	-10-31-31.9	0.9956	-1.4421	1927.8
26 OCT 1990	8190.50	14 0	30.5	-12-18-41.4	0.9942	-1.4028	1930.5
31 OCT 1990	8195.50	14 19	49.3	-13-57 -5.7	0.9928	-1.3539	1933.1
5 NOV 1990	8200.50	14 39	27.4	-15-31-55.7	0.9916	-1.2953	1936.6
10 NOV 1990	8205.50	14 59	26.4	-17 0-23.3	0.9904	-1.2261	1938.0
15 NOV 1990	8210.50	15 19	46.8	-18-21-38.4	0.9893	-1.1467	1940.1
20 NOV 1990	8215.50	15 40	28.7	-19-34-50.6	0.9882	-1.0578	1942.2
25 NOV 1990	8220.50	16 1	30.7	-20-39-11.2	0.9872	-0.9611	1944.2
30 NOV 1990	8225.50	16 22	51.2	-21-33-55.2	0.9863	-0.8578	1946.0
5 DEC 1990	8230.50	16 44	28.4	-22-18-24.5	0.9855	-0.7482	1947.5
10 DEC 1990	8235.50	17 6	19.9	-22-52 -6.3	0.9849	-0.6323	1948.8
15 DEC 1990	8240.50	17 28	22.5	-23-14-33.0	0.9843	-0.5104	1949.9
20 DEC 1990	8245.50	17 50	32.2	-23-25-25.5	0.9839	-0.3839	1950.7
25 DEC 1990	8250.50	18 12	44.4	-23-24-33.5	0.9836	-0.2550	1951.4
30 DEC 1990	8255.50	18 34	54.4	-23-11-56.4	0.9833	-0.1250	1951.8

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (^m)
4 JAN 1991	8260.50	18 56 58.6	-22-47-44.0	0.9833	0.0056	1951.9	
9 JAN 1991	8265.50	19 18 53.3	-22-12-12.9	0.9834	0.1367	1951.7	
14 JAN 1991	8270.50	19 40 35.5	-21-25-48.0	0.9836	0.2678	1951.3	
19 JAN 1991	8275.50	20 2 2.0	-20-29-3.3	0.9839	0.3970	1950.7	
24 JAN 1991	8280.50	20 23 10.0	-19-22-38.9	0.9843	0.5224	1949.8	
29 JAN 1991	8285.50	20 43 58.2	-18-7-20.0	0.9849	0.6427	1948.8	
3 FEB 1991	8290.50	21 4 25.9	-16-43-54.0	0.9856	0.7576	1947.4	
8 FEB 1991	8295.50	21 24 33.6	-15-13-8.5	0.9864	0.8672	1946.8	
13 FEB 1991	8300.50	21 44 21.8	-13-35-54.2	0.9873	0.9709	1944.0	
18 FEB 1991	8305.50	22 3 51.3	-11-53-4.8	0.9883	1.0672	1942.1	
23 FEB 1991	8310.50	22 23 3.2	-10-5-33.8	0.9893	1.1545	1940.0	
28 FEB 1991	8315.50	22 41 59.2	-8-14-13.9	0.9905	1.2320	1937.8	
5 MAR 1991	8320.50	23 0 41.5	-6-19-53.8	0.9917	1.2996	1935.4	
10 MAR 1991	8325.50	23 19 13.1	-4-23-20.0	0.9930	1.3580	1932.8	
15 MAR 1991	8330.50	23 37 36.3	-2-25-20.4	0.9944	1.4070	1930.2	
20 MAR 1991	8335.50	23 55 53.3	0-26-44.2	0.9957	1.4454	1927.5	
25 MAR 1991	8340.50	0 14 6.4	1 31 40.5	0.9971	1.4722	1924.9	
30 MAR 1991	8345.50	0 32 18.0	3 29 7.8	0.9985	1.4870	1922.2	
4 APR 1991	8350.50	0 50 30.9	5 24 55.8	1.0000	1.4907	1919.4	
9 APR 1991	8355.50	1 8 48.0	7 18 23.6	1.0014	1.4842	1916.6	
14 APR 1991	8360.50	1 27 11.4	9 8 47.7	1.0029	1.4675	1913.8	
19 APR 1991	8365.50	1 45 43.0	10 55 23.9	1.0043	1.4402	1911.2	
24 APR 1991	8370.50	2 4 24.3	12 37 28.2	1.0056	1.4017	1908.6	
29 APR 1991	8375.50	2 23 16.7	14 14 19.0	1.0069	1.3522	1906.2	
4 MAY 1991	8380.50	2 42 22.0	15 45 18.3	1.0082	1.2931	1903.7	
9 MAY 1991	8385.50	3 1 41.4	17 9 48.1	1.0094	1.2255	1901.4	
14 MAY 1991	8390.50	3 21 15.4	18 27 8.4	1.0106	1.1500	1899.2	
19 MAY 1991	8395.50	3 41 3.6	19 36 44.5	1.0118	1.0665	1897.3	
24 MAY 1991	8400.50	4 1 5.2	20 37 58.0	1.0126	0.9745	1895.5	
29 MAY 1991	8405.50	4 21 19.2	21 30 19.2	1.0134	0.8750	1893.9	
3 JUN 1991	8410.50	4 41 44.6	22 13 22.8	1.0142	0.7695	1892.3	
8 JUN 1991	8415.50	5 2 19.8	22 48 45.7	1.0150	0.6694	1891.0	
13 JUN 1991	8420.50	5 23 4.2	23 10 9.2	1.0155	0.5456	1889.9	
18 JUN 1991	8425.50	5 43 49.3	23 23 20.7	1.0160	0.4280	1889.1	
23 JUN 1991	8430.50	6 4 37.3	23 26 12.8	1.0163	0.3064	1888.5	
28 JUN 1991	8435.50	6 25 23.5	23 18 46.0	1.0165	0.1820	1888.1	
3 JUL 1991	8440.50	6 46 5.4	23 1 6.1	1.0167	0.0566	1887.8	
8 JUL 1991	8445.50	7 6 40.7	22 33 23.4	1.0167	-0.0684	1887.8	
13 JUL 1991	8450.50	7 27 6.8	21 55 54.6	1.0166	-0.1921	1888.0	
18 JUL 1991	8455.50	7 47 21.3	21 9 2.7	1.0163	-0.3149	1888.5	

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DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
23 JUL 1991	8460.50	8 7 22.0	20 13 14.6	1.0159	-0.4363	1889.2
28 JUL 1991	8465.50	8 27 8.1	19 9 1.0	1.0155	-0.5554	1890.1
2 AUG 1991	8470.50	8 46 39.3	17 50 53.2	1.0149	-0.6705	1891.1
7 AUG 1991	8475.50	9 5 55.8	16 37 24.7	1.0142	-0.7799	1892.4
12 AUG 1991	8480.50	9 24 57.8	15 11 13.1	1.0134	-0.8833	1893.8
17 AUG 1991	8485.50	9 43 45.5	13 38 58.2	1.0125	-0.9809	1895.6
22 AUG 1991	8490.50	10 2 19.9	12 1 20.5	1.0115	-1.0725	1897.5
27 AUG 1991	8495.50	10 20 42.5	10 18 59.4	1.0104	-1.1573	1899.5
1 SEP 1991	8500.50	10 38 55.6	8 32 32.1	1.0093	-1.2336	1901.6
6 SEP 1991	8505.50	10 57 1.3	6 42 37.0	1.0081	-1.3000	1903.8
11 SEP 1991	8510.50	11 15 1.7	4 49 55.8	1.0069	-1.3568	1906.2
16 SEP 1991	8515.50	11 32 59.7	2 55 11.4	1.0055	-1.4042	1908.8
21 SEP 1991	8520.50	11 50 54.4	0 59 6.9	1.0041	-1.4425	1911.4
26 SEP 1991	8525.50	12 8 51.7	0 57 36.9	1.0027	-1.4709	1914.1
1 OCT 1991	8530.50	12 26 53.4	-2 54 20.5	1.0013	-1.4880	1916.8
6 OCT 1991	8535.50	12 45 2.4	-4 50 21.6	0.9999	-1.4932	1919.5
11 OCT 1991	8540.50	13 3 20.9	-6 44 53.9	0.9985	-1.4870	1922.2
16 OCT 1991	8545.50	13 21 51.0	-8 37 9.5	0.9970	-1.4701	1925.0
21 OCT 1991	8550.50	13 40 34.7	-10 26 19.8	0.9956	-1.4433	1927.8
26 OCT 1991	8555.50	13 59 34.4	-12 11 37.9	0.9942	-1.4060	1930.5
31 OCT 1991	8560.50	14 18 52.4	-13 52 17.4	0.9929	-1.3574	1933.0
5 NOV 1991	8565.50	14 38 30.3	-15 27 28.0	0.9917	-1.2977	1935.4
10 NOV 1991	8570.50	14 58 28.9	-16 56 18.0	0.9904	-1.2274	1937.8
15 NOV 1991	8575.50	15 18 48.4	-18 17 54.9	0.9893	-1.1483	1940.2
20 NOV 1991	8580.50	15 39 28.6	-19 31 28.7	0.9882	-1.0613	1942.3
25 NOV 1991	8585.50	16 0 29.0	-20 36 13.7	0.9872	-0.9683	1944.2
30 NOV 1991	8590.50	16 21 48.8	-21 31 27.0	0.9863	-0.8631	1945.9
5 DEC 1991	8595.50	16 43 28.0	-22 16 28.2	0.9856	-0.7522	1947.4
10 DEC 1991	8600.50	17 5 17.6	-22 50 42.4	0.9849	-0.6350	1948.8
15 DEC 1991	8605.50	17 27 19.7	-23 13 41.7	0.9843	-0.5135	1949.9
20 DEC 1991	8610.50	17 49 28.5	-23 25 6.9	0.9838	-0.3888	1950.8
25 DEC 1991	8615.50	18 11 40.0	-23 24 48.8	0.9835	-0.2612	1951.4
30 DEC 1991	8620.50	18 33 50.4	-23 12 45.8	0.9834	-0.1309	1951.8

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (^m)
4 JAN 1992	8625.50	18 55	55.7	-22-49 -5.3	0.9833	0.0014	1951.8
9 JAN 1992	8630.50	19 17	51.7	-22-14 -4.9	0.9834	0.1339	1951.7
14 JAN 1992	8635.50	19 39	34.4	-21-28-10.8	0.9835	0.2646	1951.4
19 JAN 1992	8640.50	20 1	0.9	-20-31-56.5	0.9838	0.3924	1950.8
24 JAN 1992	8645.50	20 22	9.3	-19-26 -1.1	0.9843	0.5168	1949.9
29 JAN 1992	8650.50	20 42	58.6	-18-11 -6.3	0.9849	0.6379	1948.8
3 FEB 1992	8655.50	21 3	28.1	-16-47-59.3	0.9856	0.7548	1947.4
8 FEB 1992	8660.50	21 23	37.3	-15-17-31.3	0.9864	0.8658	1945.9
13 FEB 1992	8665.50	21 43	26.2	-13-40-35.5	0.9872	0.9693	1944.2
18 FEB 1992	8670.50	22 2	55.8	-11-58 -4.6	0.9882	1.0644	1942.3
23 FEB 1992	8675.50	22 22	8.0	-10-10-49.2	0.9893	1.1510	1940.1
28 FEB 1992	8680.50	22 41	4.9	-8-19-37.7	0.9904	1.2295	1937.8
4 MAR 1992	8685.50	22 59	48.7	-6-25-20.9	0.9917	1.2994	1935.4
9 MAR 1992	8690.50	23 18	21.1	-4-28-50.0	0.9930	1.3593	1932.9
14 MAR 1992	8695.50	23 36	44.4	-2-30-55.4	0.9943	1.4080	1930.4
19 MAR 1992	8700.50	23 55	0.9	0-32-24.9	0.9956	1.4452	1927.7
24 MAR 1992	8705.50	0 13	13.7	1 25 58.2	0.9971	1.4715	1925.0
29 MAR 1992	8710.50	0 31	25.6	3 23 31.1	0.9985	1.4877	1922.2
3 APR 1992	8715.50	0 49	39.1	5 19 28.9	1.0000	1.4935	1919.4
8 APR 1992	8720.50	1 7	56.3	7 13 6.0	1.0014	1.4883	1916.7
13 APR 1992	8725.50	1 26	19.0	9 3 37.4	1.0028	1.4713	1914.0
18 APR 1992	8730.50	1 44	49.3	10 50 20.5	1.0042	1.4426	1911.3
23 APR 1992	8735.50	2 3	29.7	12 32 36.3	1.0056	1.4038	1908.7
28 APR 1992	8740.50	2 22	21.9	14 9 44.9	1.0069	1.3556	1906.1
3 MAY 1992	8745.50	2 41	27.2	15 41 4.9	1.0082	1.2984	1903.7
8 MAY 1992	8750.50	3 0	46.2	17 5 55.0	1.0094	1.2318	1901.4
13 MAY 1992	8755.50	3 20	19.0	18 23 35.4	1.0105	1.1556	1899.4
18 MAY 1992	8760.50	3 40	5.7	19 33 30.2	1.0116	1.0705	1897.4
23 MAY 1992	8765.50	4 0	6.2	20 35 7.5	1.0126	0.9782	1895.5
28 MAY 1992	8770.50	4 20	20.1	21 27 56.4	1.0135	0.8798	1893.8
2 JUN 1992	8775.50	4 40	45.6	22 11 28.6	1.0143	0.7760	1892.3
7 JUN 1992	8780.50	5 1	20.6	22 45 20.2	1.0150	0.6667	1891.0
12 JUN 1992	8785.50	5 22	2.2	23 9 12.1	1.0155	0.5617	1890.0
17 JUN 1992	8790.50	5 42	48.1	23 22 52.6	1.0160	0.4323	1889.1
22 JUN 1992	8795.50	6 3	35.7	23 26 15.4	1.0163	0.3102	1888.4
27 JUN 1992	8800.50	6 24	22.5	23 19 18.8	1.0166	0.1869	1887.9
2 JUL 1992	8805.50	6 45	5.4	23 2 7.8	1.0167	0.0630	1887.7
7 JUL 1992	8810.50	7 5	41.2	22 34 54.0	1.0167	-0.0618	1887.8
12 JUL 1992	8815.50	7 26	7.2	21 57 54.5	1.0168	-0.1870	1888.0
17 JUL 1992	8820.50	7 46	21.4	21 11 31.7	1.0163	-0.3115	1888.5

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
22 JUL 1992	8825.50	8 6 22.6	20 16 10.5	1.0160	-0.4338	1889.1
27 JUL 1992	8830.50	8 26 10.0	19 12 19.3	1.0155	-0.5518	1889.9
1 AUG 1992	8835.50	8 45 42.6	18 0 31.5	1.0150	-0.6653	1891.0
6 AUG 1992	8840.50	9 4 59.9	16 41 23.6	1.0142	-0.7749	1892.3
11 AUG 1992	8845.50	9 24 2.0	15 15 33.7	1.0134	-0.8800	1893.9
16 AUG 1992	8850.50	9 42 49.7	13 43 39.7	1.0125	-0.9795	1895.5
21 AUG 1992	8855.50	10 1 24.6	12 6 17.9	1.0116	-1.0717	1897.3
26 AUG 1992	8860.50	10 19 48.4	10 24 6.5	1.0105	-1.1553	1899.3
31 AUG 1992	8865.50	10 38 2.6	8 37 46.6	1.0094	-1.2305	1901.4
5 SEP 1992	8870.50	10 56 8.7	6 48 0.6	1.0082	-1.2973	1903.8
10 SEP 1992	8875.50	11 14 8.7	4 55 30.3	1.0069	-1.3559	1906.2
15 SEP 1992	8880.50	11 32 5.2	3 0 55.4	1.0055	-1.4053	1908.7
20 SEP 1992	8885.50	11 50 1.0	1 4 53.8	1.0042	-1.4438	1911.3
25 SEP 1992	8890.50	12 7 58.9	0 51-53.4	1.0028	-1.4710	1913.9
30 SEP 1992	8895.50	12 26 1.0	-2-48-42.0	1.0014	-1.4872	1916.6
5 OCT 1992	8900.50	12 44 9.6	-4-44-46.1	0.9999	-1.4929	1919.4
10 OCT 1992	8905.50	13 2 27.0	-6-39-19.9	0.9985	-1.4887	1922.2
15 OCT 1992	8910.50	13 20 55.9	-8-31-39.5	0.9970	-1.4737	1925.0
20 OCT 1992	8915.50	13 39 39.1	-10-21 -0.8	0.9957	-1.4469	1927.6
25 OCT 1992	8920.50	13 58 38.7	-12 -6-35.4	0.9943	-1.4084	1930.3
30 OCT 1992	8925.50	14 17 50.4	-13-47-32.5	0.9930	-1.3590	1932.9
4 NOV 1992	8930.50	14 37 33.3	-15-22-59.8	0.9917	-1.2998	1935.4
9 NOV 1992	8935.50	14 57 30.2	-16-52 -5.9	0.9904	-1.2316	1937.9
14 NOV 1992	8940.50	15 17 48.1	-18-14 -2.6	0.9893	-1.1542	1940.1
19 NOV 1992	8945.50	15 38 27.5	-19-28 -2.0	0.9882	-1.0670	1942.2
24 NOV 1992	8950.50	15 59 27.8	-20-33-15.9	0.9873	-0.9707	1944.1
29 NOV 1992	8955.50	16 20 47.3	-21-28-59.1	0.9864	-0.8668	1945.8
4 DEC 1992	8960.50	16 42 23.5	-22-14-30.0	0.9856	-0.7565	1947.4
9 DEC 1992	8965.50	17 4 13.7	-22-49-14.6	0.9849	-0.6412	1948.8
14 DEC 1992	8970.50	17 26 14.8	-23-12-46.6	0.9843	-0.5210	1949.9
19 DEC 1992	8975.50	17 48 23.5	-23-24-46.3	0.9839	-0.3960	1950.7
24 DEC 1992	8980.50	18 10 35.8	-23-25 -2.2	0.9836	-0.2669	1951.3
29 DEC 1992	8985.50	18 32 46.9	-23-13-32.8	0.9834	-0.1356	1951.7

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DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (^m)
3 JAN 1993	8990.50	18 54 52.2	-22-50-25.9	0.9833	-0.0041	1951.9
8 JAN 1993	8995.50	19 16 47.8	-22-15-59.1	0.9833	0.1267	1951.8
13 JAN 1993	9000.50	19 38 30.7	-21-30-37.7	0.9835	0.2564	1951.4
18 JAN 1993	9005.50	19 59 58.3	-20-34-52.5	0.9839	0.3848	1950.7
23 JAN 1993	9010.50	20 21 8.4	-19-29-22.0	0.9843	0.5110	1949.9
28 JAN 1993	9015.50	20 41 59.0	-18-14-51.1	0.9849	0.6331	1948.8
2 FEB 1993	9020.50	21 2 29.1	-16-52-8.4	0.9855	0.7494	1947.5
7 FEB 1993	9025.50	21 22 38.4	-15-22-4.5	0.9863	0.8590	1946.0
12 FEB 1993	9030.50	21 42 27.8	-13-45-29.3	0.9872	0.9617	1944.2
17 FEB 1993	9035.50	22 1 58.7	-12-3-12.4	0.9882	1.0579	1942.2
22 FEB 1993	9040.50	22 21 12.4	-10-16-6.0	0.9893	1.1466	1940.1
27 FEB 1993	9045.50	22 40 10.3	-8-25-3.4	0.9904	1.2262	1937.9
4 MAR 1993	9050.50	22 58 54.2	-6-30-57.0	0.9916	1.2956	1935.6
9 MAR 1993	9055.50	23 17 26.4	-4-34-36.7	0.9929	1.3542	1933.1
14 MAR 1993	9060.50	23 35 49.7	-2-36-47.9	0.9942	1.4026	1930.5
19 MAR 1993	9065.50	23 54 7.0	0-38-15.7	0.9956	1.4413	1927.7
24 MAR 1993	9070.50	0 12 20.6	1 20 13.0	0.9970	1.4698	1925.0
29 MAR 1993	9075.50	0 30 32.8	3 17 50.8	0.9984	1.4871	1922.3
3 APR 1993	9080.50	0 48 45.7	5 13 51.4	0.9998	1.4925	1919.6
8 APR 1993	9085.50	1 7 1.9	7 7 31.6	1.0013	1.4861	1916.9
13 APR 1993	9090.50	1 25 24.0	8 58 11.3	1.0027	1.4691	1914.1
18 APR 1993	9095.50	1 43 54.5	10 45 9.5	1.0041	1.4422	1911.4
23 APR 1993	9100.50	2 2 35.0	12 27 43.0	1.0055	1.4055	1908.8
28 APR 1993	9105.50	2 21 28.9	14 5 8.7	1.0068	1.3584	1906.3
3 MAY 1993	9110.50	2 40 31.1	15 36 44.2	1.0081	1.3006	1903.9
8 MAY 1993	9115.50	2 59 48.7	17 1 50.8	1.0093	1.2330	1901.6
13 MAY 1993	9120.50	3 19 20.6	18 19 52.5	1.0105	1.1569	1899.4
18 MAY 1993	9125.50	3 39 7.2	19 30 13.2	1.0116	1.0736	1897.4
23 MAY 1993	9130.50	3 59 8.0	20 32 17.7	1.0126	0.9833	1895.5
28 MAY 1993	9135.50	4 19 21.5	21 25 33.4	1.0134	0.8858	1893.9
2 JUN 1993	9140.50	4 39 46.0	22 9 31.8	1.0142	0.7811	1892.5
7 JUN 1993	9145.50	5 0 19.8	22 43 50.7	1.0149	0.6706	1891.2
12 JUN 1993	9150.50	5 21 1.1	23 8 12.5	1.0155	0.5557	1890.1
17 JUN 1993	9155.50	5 41 47.5	23 22 23.5	1.0160	0.4379	1889.1
22 JUN 1993	9160.50	6 2 36.0	23 26 16.2	1.0163	0.3177	1888.4
27 JUN 1993	9165.50	6 23 23.0	23 19 49.3	1.0168	0.1948	1888.0
2 JUL 1993	9170.50	6 44 5.6	23 3 8.0	1.0167	0.0698	1887.9
7 JUL 1993	9175.50	7 4 41.1	22 36 24.0	1.0167	-0.0585	1887.9
12 JUL 1993	9180.50	7 25 7.5	21 59 52.9	1.0166	-0.1817	1888.0
17 JUL 1993	9185.50	7 45 23.1	21 13 55.1	1.0164	-0.3048	1888.4

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
22 JUL 1993	9190.50	8 5 25.8	20 18 57.1	1.0160	-0.4253	1889.1
27 JUL 1993	9195.50	8 25 13.9	19 15 29.5	1.0155	-0.5435	1890.0
1 AUG 1993	9200.50	8 44 46.6	18 4 6.0	1.0149	-0.6588	1891.1
6 AUG 1993	9205.50	9 4 4.0	16 45 21.5	1.0142	-0.7699	1892.4
11 AUG 1993	9210.50	9 23 6.8	15 19 50.3	1.0135	-0.8752	1893.8
16 AUG 1993	9215.50	9 41 55.9	13 48 9.5	1.0126	-0.9733	1895.4
21 AUG 1993	9220.50	10 0 32.1	12 10 59.4	1.0116	-1.0644	1897.2
26 AUG 1993	9225.50	10 18 56.3	10 29 1.2	1.0105	-1.1486	1899.3
31 AUG 1993	9230.50	10 37 10.3	8 42 56.3	1.0094	-1.2256	1901.5
5 SEP 1993	9235.50	10 55 16.1	6 53 23.2	1.0082	-1.2943	1903.7
10 SEP 1993	9240.50	11 13 16.5	5 0 59.5	1.0069	-1.3531	1906.1
15 SEP 1993	9245.50	11 31 13.8	3 6 25.3	1.0056	-1.4012	1908.5
20 SEP 1993	9250.50	11 49 10.2	1 10 23.6	1.0043	-1.4391	1911.1
25 SEP 1993	9255.50	12 7 7.8	0 46 21.4	1.0028	-1.4671	1913.9
30 SEP 1993	9260.50	12 25 9.0	-2 43 6.2	1.0014	-1.4854	1916.6
5 OCT 1993	9265.50	12 43 16.6	-4 39 9.6	1.0000	-1.4930	1919.3
10 OCT 1993	9270.50	13 1 33.8	-6 33 49.8	0.9986	-1.4887	1922.0
15 OCT 1993	9275.50	13 20 2.8	-8 26 21.0	0.9972	-1.4726	1924.8
20 OCT 1993	9280.50	13 38 45.8	-10 15 54.4	0.9957	-1.4453	1927.5
25 OCT 1993	9285.50	13 57 44.4	-12 1 39.6	0.9943	-1.4078	1930.2
30 OCT 1993	9290.50	14 17 0.4	-13 42 46.8	0.9930	-1.3606	1932.9
4 NOV 1993	9295.50	14 36 35.8	-15 18 28.2	0.9917	-1.3030	1935.3
9 NOV 1993	9300.50	14 56 32.0	-16 47 55.0	0.9905	-1.2347	1937.7
14 NOV 1993	9305.50	15 16 49.7	-18 10 16.2	0.9894	-1.1561	1939.9
19 NOV 1993	9310.50	15 37 28.5	-19 24 40.9	0.9883	-1.0683	1942.0
24 NOV 1993	9315.50	15 58 27.5	-20 30 19.7	0.9873	-0.9732	1944.0
29 NOV 1993	9320.50	16 19 45.3	-21 26 28.5	0.9864	-0.8712	1945.8
4 DEC 1993	9325.50	16 41 20.2	-22 12 28.7	0.9856	-0.7624	1947.4
9 DEC 1993	9330.50	17 3 10.1	-22 47 45.9	0.9849	-0.6468	1948.6
14 DEC 1993	9335.50	17 25 11.6	-23 11 51.3	0.9844	-0.5252	1949.7
19 DEC 1993	9340.50	17 47 20.5	-23 24 24.6	0.9839	-0.3994	1950.7
24 DEC 1993	9345.50	18 9 32.2	-23 25 14.2	0.9836	-0.2715	1951.4
29 DEC 1993	9350.50	18 31 42.5	-23 14 18.8	0.9834	-0.1421	1951.8

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
3 JAN 1994	9355.50	18 53 47.7	-22-51-46.2	0.9833	-0.0115	1951.9
8 JAN 1994	9360.50	19 15 44.3	-22-17-51.5	0.9834	0.1200	1951.7
13 JAN 1994	9365.50	19 37 28.6	-21-32-59.3	0.9836	0.2514	1951.3
18 JAN 1994	9370.50	19 58 57.3	-20-37-42.6	0.9839	0.3806	1950.8
23 JAN 1994	9375.50	20 20 7.7	-19-32-40.8	0.9843	0.5059	1950.0
28 JAN 1994	9380.50	20 40 58.5	-18-18-38.1	0.9848	0.6284	1948.9
2 FEB 1994	9385.50	21 1 29.2	-16-58-20.3	0.9855	0.7421	1947.6
7 FEB 1994	9390.50	21 21 39.9	-15-26-35.1	0.9863	0.8529	1946.0
12 FEB 1994	9395.50	21 41 31.0	-13-50-14.5	0.9872	0.9577	1944.2
17 FEB 1994	9400.50	22 1 2.9	-12 -8-11.9	0.9881	1.0547	1942.3
22 FEB 1994	9405.50	22 20 16.9	-10-21-21.2	0.9892	1.1426	1940.3
27 FEB 1994	9410.50	22 39 14.8	-8-30-33.8	0.9903	1.2209	1938.1
4 MAR 1994	9415.50	22 57 59.1	-6-38-37.4	0.9916	1.2901	1936.7
9 MAR 1994	9420.50	23 16 32.3	-4-40-19.7	0.9929	1.3503	1933.1
14 MAR 1994	9425.50	23 34 56.6	-2-42-30.2	0.9942	1.4008	1930.5
19 MAR 1994	9430.50	23 53 14.2	0-43-58.2	0.9955	1.4404	1927.9
24 MAR 1994	9435.50	0 11 27.5	1 14 28.2	0.9969	1.4683	1925.2
29 MAR 1994	9440.50	0 29 39.0	3 12 4.6	0.9983	1.4845	1922.5
3 APR 1994	9445.50	0 47 51.7	5 8 9.7	0.9998	1.4900	1919.7
8 APR 1994	9450.50	1 6 8.2	7 2 1.0	1.0012	1.4855	1916.9
13 APR 1994	9455.50	1 24 30.7	8 52 54.3	1.0027	1.4706	1914.2
18 APR 1994	9460.50	1 43 0.9	10 40 4.8	1.0041	1.4446	1911.6
23 APR 1994	9465.50	2 1 40.3	12 22 49.0	1.0054	1.4071	1909.0
28 APR 1994	9470.50	2 20 30.9	14 0 26.7	1.0067	1.3590	1906.5
3 MAY 1994	9475.50	2 39 34.5	15 32 20.0	1.0080	1.3016	1904.0
8 MAY 1994	9480.50	2 58 52.0	16 57 49.3	1.0093	1.2358	1901.7
13 MAY 1994	9485.50	3 18 24.0	18 16 15.1	1.0104	1.1618	1899.5
18 MAY 1994	9490.50	3 38 10.1	19 26 59.2	1.0115	1.0791	1897.6
23 MAY 1994	9495.50	3 58 9.5	20 29 26.2	1.0124	0.9878	1895.7
28 MAY 1994	9500.50	4 18 21.7	21 23 6.3	1.0133	0.8892	1894.1
2 JUN 1994	9505.50	4 38 45.7	22 7 32.7	1.0142	0.7849	1892.5
7 JUN 1994	9510.50	4 59 19.8	22 42 21.4	1.0149	0.6761	1891.2
12 JUN 1994	9515.50	5 20 1.6	23 7 13.1	1.0155	0.5630	1890.1
17 JUN 1994	9520.50	5 40 47.8	23 21 53.7	1.0159	0.4454	1889.2
22 JUN 1994	9525.50	6 1 35.5	23 26 15.9	1.0163	0.3239	1888.6
27 JUN 1994	9530.50	6 22 22.1	23 20 19.3	1.0165	0.1998	1888.1
2 JUL 1994	9535.50	6 43 5.0	23 4 8.0	1.0167	0.0748	1887.8
7 JUL 1994	9540.50	7 3 41.6	22 37 51.9	1.0167	-0.0498	1887.7
12 JUL 1994	9545.50	7 24 9.3	22 1 47.4	1.0168	-0.1737	1887.9
17 JUL 1994	9550.50	7 44 25.2	21 16 16.6	1.0164	-0.2971	1888.4

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
22 JUL 1994	9555.50	8 4 27.8	20 21 46.0	1.0160	-0.4194	1889.1
27 JUL 1994	9560.50	8 24 16.0	19 18 44.9	1.0155	-0.5390	1889.9
1 AUG 1994	9565.50	8 43 49.5	18 7 43.9	1.0150	-0.6544	1890.9
6 AUG 1994	9570.50	9 3 8.4	16 49 17.1	1.0143	-0.7642	1892.2
11 AUG 1994	9575.50	9 22 12.4	15 24 2.5	1.0138	-0.8686	1893.6
16 AUG 1994	9580.50	9 41 1.9	13 52 39.9	1.0128	-0.9677	1895.3
21 AUG 1994	9585.50	9 59 37.9	12 16 49.0	1.0117	-1.0608	1897.2
26 AUG 1994	9590.50	10 18 2.1	10 34 7.8	1.0108	-1.1468	1899.1
31 AUG 1994	9595.50	10 36 16.6	8 48 13.5	1.0095	-1.2239	1901.2
5 SEP 1994	9600.50	10 54 23.5	6 58 45.9	1.0083	-1.2915	1903.5
10 SEP 1994	9605.50	11 12 24.5	5 6 27.2	1.0070	-1.3498	1905.9
15 SEP 1994	9610.50	11 30 21.7	3 12 0.4	1.0057	-1.3991	1908.4
20 SEP 1994	9615.50	11 48 17.2	1 16 7.4	1.0043	-1.4393	1911.1
25 SEP 1994	9620.50	12 6 14.1	0-40-32.6	1.0029	-1.4692	1913.7
30 SEP 1994	9625.50	12 24 15.3	-2-37-19.6	1.0015	-1.4874	1916.4
5 OCT 1994	9630.50	12 42 23.3	-4-33-30.1	1.0001	-1.4940	1919.1
10 OCT 1994	9635.50	13 0 40.3	-6-28-17.5	0.9987	-1.4895	1921.9
15 OCT 1994	9640.50	13 19 8.3	-8-20-53.9	0.9972	-1.4747	1924.7
20 OCT 1994	9645.50	13 37 49.8	-10-10-32.3	0.9958	-1.4498	1927.4
25 OCT 1994	9650.50	13 56 47.1	-11-56-27.1	0.9944	-1.4138	1930.1
30 OCT 1994	9655.50	14 16 2.6	-13-37-51.0	0.9931	-1.3863	1932.6
4 NOV 1994	9660.50	14 35 37.7	-15-13-53.1	0.9918	-1.3077	1935.1
9 NOV 1994	9665.50	14 55 33.3	-16-43-41.1	0.9906	-1.2390	1937.6
14 NOV 1994	9670.50	15 15 49.6	-18 -6-22.7	0.9894	-1.1616	1939.9
19 NOV 1994	9675.50	15 36 28.6	-19-21 -8.8	0.9883	-1.0761	1942.0
24 NOV 1994	9680.50	15 57 24.3	-20-27-13.7	0.9873	-0.9820	1944.0
29 NOV 1994	9685.50	16 18 41.6	-21-23-53.1	0.9864	-0.8793	1945.7
4 DEC 1994	9690.50	16 40 16.7	-22-10-25.8	0.9857	-0.7690	1947.2
9 DEC 1994	9695.50	17 2 6.4	-22-46-15.7	0.9849	-0.6527	1948.6
14 DEC 1994	9700.50	17 24 6.9	-23-10-53.9	0.9843	-0.5323	1949.8
19 DEC 1994	9705.50	17 46 14.8	-23-24 -0.8	0.9839	-0.4082	1950.8
24 DEC 1994	9710.50	18 8 26.2	-23-25-25.4	0.9836	-0.2808	1951.4
29 DEC 1994	9715.50	18 30 37.3	-23-15 -4.4	0.9834	-0.1502	1951.7

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
3 JAN 1995	9720.50	18 52 43.9	-22-53 -4.4	0.9833	-0.0176	1951.9
8 JAN 1995	9725.50	19 14 41.3	-22-19-41.7	0.9833	0.1147	1951.8
13 JAN 1995	9730.50	19 36 25.8	-21-35-21.4	0.9835	0.2452	1951.5
18 JAN 1995	9735.50	19 57 54.6	-20-40-36.0	0.9838	0.3731	1951.0
23 JAN 1995	9740.50	20 19 5.9	-19-36 -2.6	0.9842	0.4983	1950.1
28 JAN 1995	9745.50	20 39 58.3	-18-22-22.8	0.9848	0.6205	1948.9
2 FEB 1995	9750.50	21 0 30.9	-17 0-24.3	0.9855	0.7385	1947.6
7 FEB 1995	9755.50	21 20 42.8	-15-30-59.3	0.9862	0.8501	1946.2
12 FEB 1995	9760.50	21 40 34.4	-13-54-57.6	0.9870	0.9542	1944.5
17 FEB 1995	9765.50	22 0 6.6	-12-13-13.8	0.9880	1.0502	1942.6
22 FEB 1995	9770.50	22 19 21.4	-10-26-36.5	0.9891	1.1384	1940.4
27 FEB 1995	9775.50	22 38 20.7	-8-35-55.5	0.9903	1.2188	1938.2
4 MAR 1995	9780.50	22 57 6.3	-6-42 -2.6	0.9915	1.2902	1935.8
9 MAR 1995	9785.50	23 15 40.1	-4-45-49.7	0.9927	1.3513	1933.3
14 MAR 1995	9790.50	23 34 4.3	-2-48 -6.7	0.9940	1.4011	1930.8
19 MAR 1995	9795.50	23 52 21.6	0-49-40.0	0.9954	1.4398	1928.1
24 MAR 1995	9800.50	0 10 35.0	1 8 47.4	0.9968	1.4882	1925.4
29 MAR 1995	9805.50	0 28 47.2	3 6 31.2	0.9983	1.4864	1922.6
3 APR 1995	9810.50	0 47 0.4	5 2 45.5	0.9997	1.4941	1919.8
8 APR 1995	9815.50	1 5 16.8	6 56 44.3	1.0011	1.4902	1917.1
13 APR 1995	9820.50	1 23 38.4	8 47 43.2	1.0025	1.4744	1914.4
18 APR 1995	9825.50	1 42 7.5	10 35 1.2	1.0039	1.4474	1911.8
23 APR 1995	9830.50	2 0 46.5	12 17 59.0	1.0054	1.4106	1909.1
28 APR 1995	9835.50	2 19 37.2	13 55 55.6	1.0067	1.3844	1906.5
3 MAY 1995	9840.50	2 38 40.7	15 28 8.6	1.0080	1.3089	1904.1
8 MAY 1995	9845.50	2 57 57.6	16 53 58.5	1.0092	1.2434	1901.8
13 MAY 1995	9850.50	3 17 28.1	18 12 40.1	1.0103	1.1681	1899.7
18 MAY 1995	9855.50	3 37 12.8	19 23 44.2	1.0114	1.0844	1897.7
23 MAY 1995	9860.50	3 57 11.7	20 26 36.1	1.0124	0.9937	1895.7
28 MAY 1995	9865.50	4 17 24.0	21 20 43.6	1.0134	0.8968	1894.0
2 JUN 1995	9870.50	4 37 48.1	22 5 37.9	1.0142	0.7941	1892.5
7 JUN 1995	9875.50	4 58 21.6	22 40 54.0	1.0148	0.6851	1891.2
12 JUN 1995	9880.50	5 19 2.2	23 6 13.1	1.0154	0.5705	1890.2
17 JUN 1995	9885.50	5 39 47.6	23 21 22.7	1.0159	0.4518	1889.2
22 JUN 1995	9890.50	6 0 35.4	23 26 15.0	1.0163	0.3305	1888.5
27 JUN 1995	9895.50	6 21 22.8	23 20 47.6	1.0166	0.2079	1888.0
2 JUL 1995	9900.50	6 42 6.4	23 5 4.9	1.0167	0.0841	1887.7
7 JUL 1995	9905.50	7 2 43.1	22 39 17.7	1.0167	-0.0412	1887.7
12 JUL 1995	9910.50	7 23 10.4	22 3 42.4	1.0166	-0.1669	1888.0
17 JUL 1995	9915.50	7 43 26.3	21 18 40.1	1.0164	-0.2917	1888.3

GEOCENTRIC EPHEMERIS FOR SUN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RV (K/S)	SIZE (")
22 JUL 1995	9920.50	8 3	29.6	20 24 34.9	1.0161	-0.4138	1888.9
27 JUL 1995	9925.50	8 23	19.2	19 21 55.5	1.0157	-0.5321	1889.7
1 AUG 1995	9930.50	8 42	53.9	18 11 15.3	1.0151	-0.6467	1890.8
6 AUG 1995	9935.50	9 2	13.1	16 53 10.7	1.0144	-0.7577	1892.1
11 AUG 1995	9940.50	9 21	17.0	15 28 18.9	1.0136	-0.8642	1893.8
16 AUG 1995	9945.50	9 40	6.6	13 57 16.5	1.0127	-0.9649	1895.2
21 AUG 1995	9950.50	9 58	43.4	12 20 39.9	1.0118	-1.0579	1896.9
26 AUG 1995	9955.50	10 17	8.8	10 39 8.5	1.0108	-1.1428	1898.9
31 AUG 1995	9960.50	10 35	24.1	8 53 24.0	1.0096	-1.2196	1901.0
5 SEP 1995	9965.50	10 53	30.9	7 4 8.3	1.0084	-1.2886	1903.4
10 SEP 1995	9970.50	11 11	31.3	5 12 2.4	1.0071	-1.3493	1905.8
15 SEP 1995	9975.50	11 29	28.1	3 17 44.4	1.0058	-1.4003	1908.2
20 SEP 1995	9980.50	11 47	24.0	1 21 53.0	1.0045	-1.4403	1910.8
25 SEP 1995	9985.50	12 5	21.4	0-34-49.6	1.0031	-1.4692	1913.4
30 SEP 1995	9990.50	12 23	22.5	-2-31-38.7	1.0016	-1.4874	1916.2
5 OCT 1995	9995.50	12 41	29.7	-4-27-49.1	1.0002	-1.4956	1919.0
10 OCT 1995	10000.50	12 59	45.4	-6-22-36.3	0.9987	-1.4936	1921.8
15 OCT 1995	10005.50	13 18	12.4	-8-15-17.7	0.9973	-1.4802	1924.5
20 OCT 1995	10010.50	13 36	53.5	-10-5-8.2	0.9959	-1.4549	1927.2
25 OCT 1995	10015.50	13 55	50.7	-11-51-18.9	0.9945	-1.4180	1929.8
30 OCT 1995	10020.50	14 15	5.6	-13-32-58.6	0.9932	-1.3705	1932.5
4 NOV 1995	10025.50	14 34	39.2	-15-9-15.2	0.9918	-1.3134	1935.1
9 NOV 1995	10030.50	14 54	32.9	-16-39-19.1	0.9906	-1.2471	1937.5
14 NOV 1995	10035.50	15 14	47.8	-18-2-22.0	0.9894	-1.1708	1939.8
19 NOV 1995	10040.50	15 35	24.3	-19-17-34.9	0.9884	-1.0845	1941.9
24 NOV 1995	10045.50	15 56	21.8	-20-24-9.0	0.9874	-0.9891	1943.8
29 NOV 1995	10050.50	16 17	38.5	-21-21-18.1	0.9865	-0.8863	1945.7
4 DEC 1995	10055.50	16 39	12.2	-22-8-20.3	0.9856	-0.7775	1947.3
9 DEC 1995	10060.50	17 1	0.4	-22-44-41.4	0.9849	-0.6631	1948.7
14 DEC 1995	10065.50	17 23	0.4	-23-9-53.8	0.9844	-0.5432	1949.8
19 DEC 1995	10070.50	17 45	8.8	-23-23-36.0	0.9839	-0.4180	1950.7
24 DEC 1995	10075.50	18 7	20.8	-23-35-35.4	0.9836	-0.2889	1951.3
29 DEC 1995	10080.50	18 29	32.3	-23-15-49.1	0.9833	-0.1579	1951.8

TEN YEAR PLANETARY EPHEMERIS : 1986-1995

SECTION 2 : Planetary Ephemerides

TEN YEAR PLANETARY EPHEMERIS : 1986-1995

SECTION 2 : Planetary Ephemerides

Column	Heading	Explanation/Definition
1	DATE	Gregorian or Calendar Date. Note that ephemeris positions are for 00:00 GMT.
2	JD	Abbreviated Julian Date. To convert to full Julian Date, add 2440000.0. Julian Date is defined as the number of days elapsed since Greenwich Mean Noon on 0 January 4713 BC.
3	RA	Apparent Right Ascension (hours, minutes, seconds) of the Planet for the mean equinox of the date.
4	DEC	Apparent Declination (degrees, arc-minutes, arc-seconds) of the Planet for the mean equinox of the date.
5	DELTA	Distance of Planet from Earth in AU's. (1 AU = 1.496E+08 km)
6	RHO	Distance of Planet from the Sun in AU's. (1 AU = 1.496E+08 km)
7	RV	Geocentric Radial Velocity of Planet. (km/sec)
8	MAG	Apparent Visual Magnitude of Planet.
9	SIZE	Apparent Angular Diameter of Planet. (arc-seconds)
10	PHASE	Fraction of Planet illuminated by direct sunlight.
11	ELONG	Geocentric Elongation of Planet from the Sun or Planet-Earth-Sun angle. (+ = West of Sun, - = East of Sun)

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1986	6435.50	17 54	24.3	-23-39-13.1	1.3188	0.4565	18.0342	-0.33	5.07	0.907	15.62
10 JAN 1986	6440.50	18 27	15.7	-24 -4-51.1	1.3640	0.4649	13.2896	-0.38	4.90	0.937	13.24
15 JAN 1986	6445.50	19 1	3.1	-23-58-53.8	1.3958	0.4664	8.7718	-0.46	4.79	0.960	10.89
20 JAN 1986	6450.50	19 35	28.9	-23-18-59.6	1.4147	0.4609	4.2923	-0.59	4.73	0.978	7.98
25 JAN 1986	6455.50	20 10	19.6	-22 -3-24.0	1.4204	0.4486	-0.3951	-0.76	4.71	0.990	5.13
30 JAN 1986	6460.50	20 45	23.5	-20-10-51.9	1.4119	0.4300	-6.6008	-0.98	4.74	0.997	2.53
4 FEB 1986	6465.50	21 20	29.4	-17-40-45.6	1.3872	0.4059	-11.7144	-1.11	4.82	0.996	-2.97
9 FEB 1986	6470.50	21 55	22.2	-14-33-43.7	1.3430	0.3781	-19.1540	-1.15	4.98	0.998	-6.29
14 FEB 1986	6475.50	22 29	31.5	-10-53-18.2	1.2751	0.3494	-28.1297	-1.13	5.24	0.934	-10.15
19 FEB 1986	6480.50	23 1	50.8	-6-49-23.6	1.1796	0.3245	-37.9902	-1.00	5.67	0.839	-13.95
24 FEB 1986	6485.50	23 30	5.5	-2-43-40.1	1.0572	0.3098	-46.1748	-0.69	6.33	0.679	-16.98
1 MAR 1986	6490.50	23 50	40.8	0 47 32.2	0.9186	0.3094	-49.4880	-0.72	7.28	0.463	-18.15
6 MAR 1986	6495.50	23 59	47.4	3 0 40.3	0.7854	0.3242	-42.3353	0.72	8.51	0.243	-16.27
11 MAR 1986	6500.50	23 55	51.9	3 22 48.5	0.6811	0.3489	-29.0419	1.78	9.82	0.078	-10.86
16 MAR 1986	6505.50	23 42	11.8	1 54 23.6	0.6208	0.3776	-12.5747	2.88	10.77	0.008	-3.85
21 MAR 1986	6510.50	23 20	36.0	0-35-54.2	0.6070	0.4055	2.4947	2.42	11.02	0.034	8.45
26 MAR 1986	6515.50	23 16	34.2	-2-58-48.6	0.6310	0.4297	13.3235	1.68	10.60	0.120	16.28
31 MAR 1986	6520.50	23 15	13.3	-4-30-10.9	0.6798	0.4484	19.8156	1.21	9.84	0.225	22.04
5 APR 1986	6525.50	23 22	3.4	-4-58-57.7	0.7425	0.4608	23.2584	0.91	9.01	0.327	25.60
10 APR 1986	6530.50	23 35	19.8	-4-30-15.2	0.8124	0.4664	24.9295	0.71	8.23	0.417	27.32
15 APR 1986	6535.50	23 53	24.8	-3-12-46.8	0.8856	0.4650	25.6603	0.55	7.55	0.496	27.61
20 APR 1986	6540.50	0 15	9.8	-1-14-30.7	0.9601	0.4567	25.8731	0.38	6.96	0.569	26.76
25 APR 1986	6545.50	0 39	56.2	1 18 1.4	1.0347	0.4418	25.6927	0.20	6.46	0.639	24.96
30 APR 1986	6550.50	1 7	30.2	4 19 16.6	1.1080	0.4208	24.9894	-0.04	6.04	0.709	22.30
5 MAY 1986	6555.50	1 37	57.7	7 43 46.7	1.1781	0.3950	23.3654	-0.34	5.68	0.783	18.83
10 MAY 1986	6560.50	2 11	41.0	11 24 54.4	1.2414	0.3663	20.0978	-0.72	5.39	0.860	14.56
15 MAY 1986	6565.50	2 49	9.6	15 12 52.3	1.2916	0.3385	14.1522	-1.18	5.18	0.935	9.49
20 MAY 1986	6570.50	3 30	38.9	18 51 58.6	1.3197	0.3169	4.7225	-1.66	5.07	0.989	3.73
25 MAY 1986	6575.50	4 15	30.4	21 59 44.4	1.3162	0.3076	-7.3605	-1.81	5.08	0.995	-2.50
30 MAY 1986	6580.50	5 1	42.7	24 13 0.5	1.2777	0.3138	-18.9352	-1.38	5.23	0.939	-8.55
4 JUN 1986	6585.50	5 46	29.0	25 19 38.6	1.2104	0.3334	-26.9402	-0.89	5.52	0.839	-13.98
9 JUN 1986	6590.50	6 27	32.5	25 22 54.7	1.1261	0.3604	-30.8520	-0.41	5.94	0.728	-18.46
14 JUN 1986	6595.50	7 3	36.7	24 35 20.4	1.0351	0.3892	-31.8079	0.00	6.46	0.619	-21.86
19 JUN 1986	6600.50	7 34	6.5	23 11 46.0	0.9441	0.4159	-31.0036	0.34	7.08	0.520	-24.14
24 JUN 1986	6605.50	7 58	42.0	21 28 23.0	0.8570	0.4380	-29.1534	0.64	7.80	0.429	-26.25
29 JUN 1986	6610.50	8 17	0.4	19 32 27.2	0.7764	0.4542	-26.5218	0.91	8.61	0.341	-25.06
4 JUL 1986	6615.50	8 28	28.7	17 42 59.5	0.7047	0.4639	-23.0108	1.20	9.49	0.254	-23.39
9 JUL 1986	6620.50	8 32	28.0	16 11 28.5	0.6448	0.4667	-18.2308	1.55	10.37	0.167	-20.05
14 JUL 1986	6625.50	8 28	39.9	15 11 22.3	0.6011	0.4625	-11.6198	2.02	11.12	0.088	-14.94
19 JUL 1986	6630.50	8 18	5.3	14 53 6.3	0.5798	0.4514	-2.7499	2.62	11.53	0.029	-8.64

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6635.50	8 4	7.8	15 18 25.3	0.5872	0.4340	8.1408	2.97	11.39	0.011	5.05
29 JUL 1986	6640.50	7 52	18.6	16 18 38.9	0.6277	0.4108	19.9184	2.33	10.65	0.046	9.77
3 AUG 1986	6645.50	7 48	3.4	17 28 1.2	0.7017	0.3835	31.0549	1.53	9.53	0.137	15.07
8 AUG 1986	6650.50	7 54	35.4	18 29 55.1	0.8051	0.3546	40.0947	0.78	8.31	0.277	18.24
13 AUG 1986	6655.50	8 12	36.9	18 59 30.8	0.9296	0.3286	45.4003	0.07	7.19	0.455	18.85
18 AUG 1986	6660.50	8 40	48.8	18 35 22.9	1.0618	0.3113	45.0404	-0.66	6.30	0.651	17.05
23 AUG 1986	6665.50	9 16	6.1	17 3 58.9	1.1835	0.3082	38.3184	-1.04	5.65	0.824	13.42
28 AUG 1986	6670.50	9 54	24.6	14 28 17.0	1.2792	0.3204	27.6285	-1.33	5.23	0.938	8.78
2 SEP 1986	6675.50	10 32	22.1	11 6 9.4	1.3430	0.3438	16.7226	-1.45	4.98	0.989	4.03
7 SEP 1986	6680.50	11 8	17.8	7 18 41.3	1.3777	0.3722	7.6763	-1.35	4.85	0.998	-2.02
12 SEP 1986	6685.50	11 41	51.3	3 22 2.7	1.3893	0.4005	0.7077	-0.99	4.81	0.984	-5.70
17 SEP 1986	6690.50	12 13	18.2	0-33-25.8	1.3833	0.4255	-4.6955	-0.68	4.83	0.960	-9.49
22 SEP 1986	6695.50	12 43	4.4	-4-21-24.1	1.3631	0.4453	-9.1167	-0.44	4.91	0.932	-12.91
27 SEP 1986	6700.50	13 11	34.0	-7-57-46.1	1.3311	0.4590	-13.0088	-0.27	5.02	0.900	-15.94
2 OCT 1986	6705.50	13 39	4.2	-11-19-25.1	1.2882	0.4659	-16.6848	-0.14	5.19	0.884	-18.59
7 OCT 1986	6710.50	14 5	43.0	-14-23-28.9	1.2348	0.4658	-20.3444	-0.05	5.42	0.823	-20.85
12 OCT 1986	6715.50	14 31	24.5	-17-6-47.7	1.1706	0.4588	-24.0788	0.01	5.71	0.772	-22.68
17 OCT 1986	6720.50	14 55	42.1	-19-25-22.4	1.0957	0.4451	-27.8455	0.06	6.10	0.708	-23.97
22 OCT 1986	6725.50	15 17	35.2	-21-13-42.9	1.0100	0.4252	-31.3851	0.13	6.62	0.622	-24.47
27 OCT 1986	6730.50	15 35	4.8	-22-23-28.8	0.9154	0.4001	-33.8938	0.25	7.31	0.507	-23.73
1 NOV 1986	6735.50	15 44	40.9	-22-40-50.5	0.8171	0.3717	-33.4050	0.53	8.18	0.352	-20.96
6 NOV 1986	6740.50	15 41	30.6	-21-43-31.1	0.7291	0.3434	-25.9624	1.16	9.17	0.167	-14.98
11 NOV 1986	6745.50	15 23	13.1	-19-12-35.3	0.6784	0.3201	-7.1377	2.41	9.88	0.019	-5.10
16 NOV 1986	6750.50	14 59	1.4	-15-52-43.9	0.6955	0.3082	19.1167	2.11	9.61	0.034	6.50
21 NOV 1986	6755.50	14 45	56.0	-13-44-40.2	0.7816	0.3115	38.2817	0.73	8.56	0.225	15.26
26 NOV 1986	6760.50	14 49	58.1	-13-41-50.2	0.9032	0.3289	44.0073	0.00	7.40	0.458	19.40
1 DEC 1986	6765.50	15 6	33.9	-15-5-38.1	1.0274	0.3550	41.0883	-0.31	6.51	0.643	20.18
6 DEC 1986	6770.50	15 30	21.6	-17-6-29.9	1.1376	0.3839	34.9636	-0.42	5.88	0.789	19.16
11 DEC 1986	6775.50	15 58	8.7	-19-13-2.1	1.2289	0.4112	28.3511	-0.45	5.44	0.851	17.29
16 DEC 1986	6780.50	16 28	19.3	-21-8-17.5	1.3017	0.4343	22.1659	-0.46	5.14	0.904	15.04
21 DEC 1986	6785.50	17 0	7.0	-22-43-0.2	1.3575	0.4517	16.5632	-0.47	4.93	0.940	12.60
26 DEC 1986	6790.50	17 33	7.6	-23-51-35.4	1.3979	0.4626	11.4374	-0.51	4.78	0.964	10.06
31 DEC 1986	6795.50	18 7	5.4	-24-30-14.3	1.4239	0.4667	6.6036	-0.58	4.70	0.981	7.46

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	18 41	47.5	-24-36 -3.2	1.4361	0.4638	1.8599	-0.69	4.66	0.992	4.84
10 JAN 1987	6805.50	19 17	07.7	-24 -6-40.5	1.4345	0.4540	-3.0226	-0.83	4.66	0.998	2.48
15 JAN 1987	6810.50	19 52	31.2	-23 0-13.0	1.4182	0.4377	-8.3245	-0.93	4.72	0.998	-2.50
20 JAN 1987	6815.50	20 28	2.1	-21-15-22.5	1.3857	0.4155	-14.3764	-0.98	4.83	0.988	-5.21
25 JAN 1987	6820.50	21 3	10.3	-18-51-56.4	1.3341	0.3888	-21.5250	-0.98	5.01	0.984	-8.51
30 JAN 1987	6825.50	21 37	16.1	-15-52-11.3	1.2601	0.3600	-29.9481	-0.97	5.31	0.912	-11.96
4 FEB 1987	6830.50	22 9	2.3	-12-24 -0.3	1.1604	0.3330	-39.0958	-0.87	5.76	0.814	-15.23
9 FEB 1987	6835.50	22 36	0.3	-8-46-34.7	1.0357	0.3136	-46.6841	-0.60	6.46	0.652	-17.63
14 FEB 1987	6840.50	22 54	7.1	-5-36-16.1	0.8965	0.3076	-48.3578	-0.04	7.46	0.431	-17.97
19 FEB 1987	6845.50	22 58	51.6	-3-42-32.9	0.7658	0.3171	-40.4594	0.86	8.73	0.202	-14.92
24 FEB 1987	6850.50	22 48	57.8	-3-43-18.7	0.6712	0.3389	-24.0818	2.08	9.96	0.045	-8.16
1 MAR 1987	6855.50	22 30	21.1	-5-20-59.9	0.6293	0.3667	-5.1150	2.74	10.63	0.011	4.50
6 MAR 1987	6860.50	22 13	42.2	-7-47-58.0	0.6378	0.3954	10.0712	1.86	10.48	0.083	12.69
11 MAR 1987	6865.50	22 6	15.2	-9-41-49.5	0.6815	0.4212	19.2067	1.24	9.81	0.200	19.82
16 MAR 1987	6870.50	22 9	1.6	-10-42 -7.4	0.7442	0.4421	23.5937	0.87	8.99	0.318	24.45
21 MAR 1987	6875.50	22 20	0.7	-10-47-36.8	0.8151	0.4669	25.1936	0.68	8.20	0.420	26.93
26 MAR 1987	6880.50	22 36	52.5	-10 -4-26.6	0.8883	0.4851	25.3666	0.51	7.53	0.506	27.79
31 MAR 1987	6885.50	22 57	51.0	-8-39 -4.6	0.9610	0.4863	24.8845	0.39	6.96	0.580	27.44
5 APR 1987	6890.50	23 21	48.1	-6-36-45.4	1.0316	0.4806	24.0346	0.26	6.48	0.645	26.15
10 APR 1987	6895.50	23 48	6.4	-4 -1-38.4	1.0995	0.4481	22.9505	0.09	6.08	0.706	24.05
15 APR 1987	6900.50	0 16	31.1	0-57-13.0	1.1638	0.4293	21.4753	-0.12	5.75	0.766	21.23
20 APR 1987	6905.50	0 47	6.1	2 33 6.5	1.2228	0.4051	19.2494	-0.39	5.47	0.828	17.71
25 APR 1987	6910.50	1 20	9.3	6 26 5.5	1.2737	0.3772	15.6392	-0.75	5.25	0.892	13.48
30 APR 1987	6915.50	1 56	7.0	10 32 8.0	1.3110	0.3485	9.7464	-1.18	5.10	0.952	8.53
5 MAY 1987	6920.50	2 35	20.1	14 42 44.7	1.3269	0.3239	0.7428	-1.66	5.04	0.994	2.92
10 MAY 1987	6925.50	3 17	33.7	18 38 1.8	1.3125	0.3093	-10.9985	-1.76	5.09	0.992	-3.12
15 MAY 1987	6930.50	4 1	22.7	21 53 46.9	1.2633	0.3097	-22.7708	-1.38	5.29	0.928	-9.10
20 MAY 1987	6935.50	4 44	21.1	24 10 37.1	1.1844	0.3248	-31.1389	-0.89	5.65	0.815	-14.44
25 MAY 1987	6940.50	5 24	3.6	25 23 14.5	1.0879	0.3498	-34.9616	-0.38	6.15	0.684	-18.73
30 MAY 1987	6945.50	5 58	50.7	25 38 47.0	0.9859	0.3765	-35.2660	0.08	6.78	0.559	-21.77
4 JUN 1987	6950.50	6 27	41.5	25 9 46.3	0.8863	0.4063	-33.4146	0.47	7.54	0.446	-23.46
9 JUN 1987	6955.50	6 49	52.7	24 9 33.2	0.7941	0.4303	-30.2399	0.83	8.42	0.343	-23.74
14 JUN 1987	6960.50	7 4	43.8	22 50 51.2	0.7127	0.4489	-26.0211	1.18	9.38	0.248	-22.45
19 JUN 1987	6965.50	7 11	38.1	21 25 44.2	0.6449	0.4610	-20.6651	1.58	10.37	0.160	-19.45
24 JUN 1987	6970.50	7 10	24.4	20 5 48.9	0.5947	0.4604	-13.8863	2.06	11.25	0.084	-14.72
29 JUN 1987	6975.50	7 2	2.8	19 2 11.3	0.5663	0.4848	-5.4838	2.66	11.81	0.028	-8.71
4 JUL 1987	6980.50	6 49	34.1	18 24 28.0	0.5843	0.4564	4.2862	3.08	11.85	0.008	4.54
9 JUL 1987	6985.50	6 37	46.3	18 18 31.7	0.5916	0.4412	14.5933	2.58	11.30	0.032	8.74
14 JUL 1987	6990.50	6 31	30.6	18 43 44.1	0.6461	0.4201	24.4174	1.88	10.32	0.099	14.29
19 JUL 1987	6995.50	6 33	57.4	19 31 38.2	0.7314	0.3941	32.9823	1.23	9.14	0.203	18.17

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1987	7000.50	6 46	21.8	20 27	8.9	0.8368	39.6448	0.61	7.99	0.338	19.89
29 JUL 1987	7005.50	7 8	43.1	21 10	16.3	0.9678	43.3595	0.01	6.98	0.500	19.42
3 AUG 1987	7010.50	7 40	3.9	21 17	55.8	1.0828	42.4641	-0.58	6.18	0.677	16.95
8 AUG 1987	7015.50	8 18	10.9	20 29	12.9	1.1972	35.8363	-1.09	5.59	0.839	12.88
13 AUG 1987	7020.50	8 59	32.0	18 35	27.3	1.2856	25.0142	-1.43	5.20	0.949	7.87
18 AUG 1987	7025.50	9 40	33.2	15 45	36.8	1.3412	13.6286	-1.58	4.99	0.994	2.92
23 AUG 1987	7030.50	10 19	5.9	12 18	36.2	1.3663	4.2021	-1.36	4.89	0.994	-3.29
28 AUG 1987	7035.50	10 54	33.3	8 32	24.7	1.3678	0.3901	-0.96	4.89	0.970	-7.62
2 SEP 1987	7040.50	11 27	8.3	4 39	53.1	1.3517	-8.0417	-0.63	4.95	0.936	-11.65
7 SEP 1987	7045.50	11 57	18.6	0 49	21.9	1.3224	-12.0818	-0.37	5.06	0.899	-16.21
12 SEP 1987	7050.50	12 25	31.2	-2-53-38.8	1.2825	0.4546	-15.4799	-0.18	5.21	0.859	-18.30
17 SEP 1987	7055.50	12 52	6.1	-6-25-8.5	1.2333	0.4641	-18.5884	-0.03	5.42	0.817	-20.91
22 SEP 1987	7060.50	13 17	11.9	-9-41-34.8	1.1753	0.4666	-21.6116	0.07	5.69	0.769	-23.05
27 SEP 1987	7065.50	13 40	42.5	-12-39-7.7	1.1085	0.4622	-24.6251	0.15	6.03	0.713	-24.64
2 OCT 1987	7070.50	14 2	9.7	-15-12-52.2	1.0331	0.4510	-27.5399	0.22	6.47	0.644	-25.56
7 OCT 1987	7075.50	14 20	30.7	-17-15-34.6	0.9499	0.4333	-29.9983	0.30	7.04	0.555	-25.52
12 OCT 1987	7080.50	14 33	48.5	-18-35-38.3	0.8611	0.4100	-31.1087	0.46	7.77	0.439	-24.06
17 OCT 1987	7085.50	14 38	53.1	-18-53-38.0	0.7733	0.3826	-28.8851	0.79	8.65	0.290	-20.37
22 OCT 1987	7090.50	14 32	1.5	-17-41-4.3	0.7010	0.3637	-19.7322	1.47	9.54	0.123	-13.48
27 OCT 1987	7095.50	14 13	12.3	-14-43-11.0	0.6694	0.3279	-0.4305	2.75	9.99	0.008	-3.26
1 NOV 1987	7100.50	13 52	33.7	-11-5-29.1	0.7041	0.3110	24.3304	1.91	9.50	0.051	7.96
6 NOV 1987	7105.50	13 44	15.8	-8-57-4.8	0.8026	0.3084	41.7735	0.59	8.33	0.254	15.71
11 NOV 1987	7110.50	13 52	4.5	-9-5-45.4	0.9326	0.3210	46.3420	-0.13	7.17	0.494	18.92
16 NOV 1987	7115.50	14 11	13.8	-10-50-8.6	1.0620	0.3446	42.3349	-0.46	6.30	0.683	18.92
21 NOV 1987	7120.50	14 36	36.0	-13-18-22.8	1.1742	0.3731	35.1790	-0.58	5.70	0.809	17.26
26 NOV 1987	7125.50	15 5	11.8	-15-56-59.6	1.2649	0.4013	27.7342	-0.61	5.29	0.888	14.89
1 DEC 1987	7130.50	16 35	37.4	-18-27-48.4	1.3350	0.4262	20.9497	-0.61	5.01	0.936	12.25
6 DEC 1987	7135.50	16 7	17.5	-20-41-1.3	1.3867	0.4459	14.9345	-0.61	4.82	0.965	9.53
11 DEC 1987	7140.50	16 39	58.0	-22-30-50.4	1.4219	0.4593	9.5203	-0.64	4.70	0.983	6.82
16 DEC 1987	7145.50	17 13	32.1	-23-53-15.0	1.4420	0.4660	4.4601	-0.70	4.64	0.994	4.18
21 DEC 1987	7150.50	17 47	53.9	-24-45-3.2	1.4479	0.4657	-0.4199	-0.79	4.62	0.999	1.87
26 DEC 1987	7155.50	18 22	54.3	-25-3-28.2	1.4395	0.4585	-5.4086	-0.81	4.65	0.998	-2.30
31 DEC 1987	7160.50	18 58	20.4	-24-46-2.0	1.4163	0.4446	-10.7291	-0.80	4.72	0.991	-4.89

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	7185.50	19 33 53.0	-23-50-45.8	1.3769	0.4245	-16.6630	-0.80	4.86	0.975	-7.82
10 JAN 1988	7170.50	20 9 2.8	-22-16-36.8	1.3192	0.3993	-23.4889	-0.81	5.07	0.943	-10.88
15 JAN 1988	7175.50	20 43 1.1	-20 -4-37.8	1.2437	0.3708	-31.3286	-0.81	5.39	0.885	-13.92
20 JAN 1988	7180.50	21 14 19.0	-17-20-42.2	1.1377	0.3426	-39.6911	-0.73	5.88	0.785	-16.84
25 JAN 1988	7185.50	21 40 11.3	-14-20-59.6	1.0125	0.3198	-46.6032	-0.49	6.80	0.622	-18.35
30 JAN 1988	7190.50	21 56 3.4	-11-39 -6.2	0.8749	0.3080	-47.3492	0.06	7.64	0.398	-17.83
4 FEB 1988	7195.50	21 56 38.6	-10 -4-51.9	0.7494	0.3118	-37.6210	1.02	8.92	0.185	-13.60
9 FEB 1988	7200.50	21 41 7.7	-10-15-18.5	0.6672	0.3296	-18.1976	2.35	10.02	0.023	-5.79
14 FEB 1988	7205.50	21 18 38.0	-11-49-12.4	0.6457	0.3559	2.6879	2.32	10.36	0.031	7.14
19 FEB 1988	7210.50	21 2 19.8	-13-40-23.0	0.6763	0.3848	17.1797	1.41	9.89	0.143	15.82
24 FEB 1988	7215.50	20 58 11.7	-15 -1-54.6	0.7377	0.4120	24.2919	0.89	9.07	0.282	22.00
29 FEB 1988	7220.50	21 5 4.8	-15-40-12.8	0.8120	0.4349	26.6469	0.61	8.24	0.406	25.54
5 MAR 1988	7225.50	21 19 52.4	-15-35-40.5	0.8893	0.4521	26.5903	0.45	7.52	0.507	27.11
10 MAR 1988	7230.50	21 39 56.9	-14-51-23.9	0.9646	0.4628	26.4637	0.35	6.93	0.589	27.30
15 MAR 1988	7235.50	22 3 32.4	-13-30-22.9	1.0359	0.4667	23.8747	0.25	6.46	0.658	26.47
20 MAR 1988	7240.50	22 29 33.2	-11-35 -9.2	1.1023	0.4636	22.1143	0.14	6.07	0.714	24.87
25 MAR 1988	7245.50	22 57 22.7	-9 -7-49.9	1.1635	0.4538	20.2132	0.00	5.75	0.768	22.60
30 MAR 1988	7250.50	23 26 45.5	-6-10-18.5	1.2188	0.4371	18.0292	-0.20	5.49	0.819	19.71
4 APR 1988	7255.50	23 57 41.9	-2-44-30.3	1.2670	0.4148	15.2372	-0.45	5.28	0.870	16.22
9 APR 1988	7260.50	0 30 24.8	1 7 6.4	1.3057	0.3880	11.2917	-0.78	5.12	0.921	12.09
14 APR 1988	7265.50	1 5 15.0	5 20 21.3	1.3304	0.3591	5.4066	-1.18	5.03	0.967	7.33
19 APR 1988	7270.50	1 42 31.4	9 47 16.8	1.3342	0.3323	-3.2130	-1.66	5.01	0.997	2.00
24 APR 1988	7275.50	2 22 9.0	14 13 8.2	1.3092	0.3132	-14.5097	-1.69	5.11	0.988	-3.89
29 APR 1988	7280.50	3 3 5.8	18 15 25.1	1.2499	0.3077	-26.3132	-1.36	5.35	0.918	-9.66
4 MAY 1988	7285.50	3 43 15.3	21 30 29.1	1.1602	0.3178	-35.0222	-0.88	5.76	0.792	-14.82
9 MAY 1988	7290.50	4 20 11.5	23 44 53.7	1.0525	0.3396	-38.7801	-0.35	6.35	0.643	-18.81
14 MAY 1988	7295.50	4 51 58.0	24 58 48.0	0.9403	0.3676	-38.3627	0.16	7.11	0.498	-21.33
19 MAY 1988	7300.50	5 17 14.5	25 20 19.2	0.8335	0.3962	-35.2785	0.63	8.02	0.370	-22.21
24 MAY 1988	7305.50	5 34 59.6	24 59 40.0	0.7381	0.4219	-30.5121	1.08	9.06	0.257	-21.35
29 MAY 1988	7310.50	5 44 26.1	24 6 33.6	0.6585	0.4428	-24.4151	1.54	10.15	0.159	-18.62
3 JUN 1988	7315.50	5 45 21.5	22 50 16.8	0.5984	0.4573	-16.9912	2.09	11.17	0.078	-14.00
8 JUN 1988	7320.50	5 38 50.8	21 21 42.7	0.5616	0.4652	-8.2860	2.73	11.91	0.023	-7.91
13 JUN 1988	7325.50	5 27 55.4	19 56 5.4	0.5514	0.4663	1.2745	3.24	12.13	0.004	-3.31
18 JUN 1988	7330.50	5 17 6.9	18 52 13.8	0.5690	0.4603	10.8704	2.69	11.75	0.026	8.28
23 JUN 1988	7335.50	5 10 48.2	18 25 18.2	0.6134	0.4477	19.6911	2.03	10.90	0.084	14.18
28 JUN 1988	7340.50	5 11 37.9	18 39 37.6	0.6816	0.4287	27.3114	1.47	9.81	0.170	18.49
3 JUL 1988	7345.50	5 20 46.4	19 28 20.0	0.7699	0.4043	33.5982	0.96	8.69	0.277	20.85
8 JUL 1988	7350.50	5 38 21.5	20 37 13.2	0.8741	0.3761	38.3087	0.47	7.65	0.403	21.29
13 JUL 1988	7355.50	6 4 13.5	21 47 34.8	0.9889	0.3477	40.6910	-0.06	6.76	0.548	19.90
18 JUL 1988	7360.50	6 37 55.2	22 37 1.8	1.1055	0.3232	39.3182	-0.60	6.05	0.706	16.85

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	7 18	6.7	22 41 37.4	1.2110	0.3091	32.8508	-1.12	5.52	0.854	12.41
28 JUL 1988	7370.50	8 2	1.2	21 43 46.8	1.2910	0.3099	22.0558	-1.50	5.18	0.967	7.10
2 AUG 1988	7375.50	8 46	4.1	19 42 7.4	1.3375	0.3254	10.2843	-1.69	5.00	0.997	2.10
7 AUG 1988	7380.50	9 27	33.5	16 50 34.2	1.3522	0.3508	0.4315	-1.37	4.95	0.987	-4.54
12 AUG 1988	7385.50	10 5	24.7	13 27 38.9	1.3426	0.3794	-6.6908	-0.94	4.98	0.951	-9.27
17 AUG 1988	7390.50	10 39	39.1	9 48 47.5	1.3157	0.4071	-11.6833	-0.58	5.08	0.907	-13.52
22 AUG 1988	7395.50	11 10	43.3	8 4 52.2	1.2785	0.4310	-15.2689	-0.31	5.24	0.860	-17.20
27 AUG 1988	7400.50	11 39	6.0	2 23 21.4	1.2282	0.4493	-18.0978	-0.09	5.44	0.812	-20.32
1 SEP 1988	7405.50	12 5	8.5	-1 10-14.2	1.1724	0.4613	-20.5466	0.07	5.70	0.763	-22.88
6 SEP 1988	7410.50	12 29	0.3	-4-31-12.9	1.1097	0.4865	-22.8329	0.19	6.03	0.709	-24.86
11 SEP 1988	7415.50	12 50	34.3	-7-34-37.8	1.0408	0.4647	-25.0110	0.28	6.43	0.648	-26.17
16 SEP 1988	7420.50	13 9	20.0	-10-14 -9.6	0.9655	0.4500	-26.9466	0.38	6.93	0.574	-26.66
21 SEP 1988	7425.50	13 24	12.8	-12-20-29.8	0.8856	0.4407	-28.2005	0.49	7.55	0.481	-26.02
26 SEP 1988	7430.50	13 33	19.8	-13-38-46.2	0.8042	0.4194	-27.7742	0.70	8.32	0.365	-23.75
1 OCT 1988	7435.50	13 33	59.5	-13-45-34.7	0.7287	0.3932	-23.6971	1.09	9.18	0.224	-19.11
6 OCT 1988	7440.50	13 23	55.0	-12-12-27.4	0.6738	0.3645	-12.9116	1.83	9.92	0.080	-11.42
11 OCT 1988	7445.50	13 5	20.9	-8-58-22.1	0.6225	0.3389	6.3522	3.01	10.09	0.003	1.96
16 OCT 1988	7450.50	12 48	37.4	-5-24-43.8	0.7139	0.3159	28.9293	1.71	9.37	0.074	9.56
21 OCT 1988	7455.50	12 44	56.7	-3-30-22.2	0.8225	0.3075	44.3513	0.48	8.13	0.283	16.16
26 OCT 1988	7460.50	12 56	17.8	-3-53-10.2	0.9584	0.3147	47.9075	-0.25	6.98	0.524	18.43
31 OCT 1988	7465.50	13 17	55.3	-5-54-58.9	1.0910	0.3349	43.0296	-0.60	6.13	0.717	17.69
5 NOV 1988	7470.50	13 44	52.6	-8-45-56.9	1.2039	0.3622	34.9675	-0.73	5.55	0.843	16.43
10 NOV 1988	7475.50	14 14	17.9	-11-51-53.5	1.2929	0.3910	26.7727	-0.76	5.17	0.917	12.56
15 NOV 1988	7480.50	14 44	55.5	-14-53-42.3	1.3594	0.4174	19.4569	-0.76	4.92	0.980	9.52
20 NOV 1988	7485.50	15 16	19.0	-17-41 -6.3	1.4082	0.4392	13.1032	-0.76	4.76	0.983	6.52
25 NOV 1988	7490.50	15 48	22.8	-20 -8-10.0	1.4358	0.4560	7.4926	-0.78	4.66	0.995	3.61
30 NOV 1988	7495.50	16 21	8.4	-22-10-54.8	1.4499	0.4643	2.3443	-0.82	4.61	1.000	1.03
5 DEC 1988	7500.50	16 54	37.5	-23-46 -7.7	1.4496	0.4668	-2.8025	-0.76	4.61	0.998	-2.32
10 DEC 1988	7505.50	17 28	47.8	-24-50-52.3	1.4349	0.4620	-7.5877	-0.69	4.66	0.991	-5.03
15 DEC 1988	7510.50	18 3	30.5	-25-22-20.8	1.4055	0.4508	-12.8412	-0.65	4.76	0.978	-7.80
20 DEC 1988	7515.50	18 38	27.6	-25-18 -0.3	1.3602	0.4327	-18.5891	-0.64	4.92	0.954	-10.58
25 DEC 1988	7520.50	19 13	7.4	-24-35-59.4	1.2974	0.4092	-25.0441	-0.65	5.15	0.916	-13.35
30 DEC 1988	7525.50	19 46	34.4	-23-16 -7.3	1.2148	0.3817	-32.2695	-0.65	5.50	0.853	-15.96

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1989	7530.50	20 17	8.5	-21-22 -8.8	1.1107	0.3529	-39.7761	-0.58	6.02	0.750	-18.12
9 JAN 1989	7535.50	20 41	46.7	-19 -6-27.5	0.9866	0.3272	-45.6437	-0.36	6.78	0.588	-19.12
14 JAN 1989	7540.50	20 55	21.7	-16-56-58.6	0.8629	0.3107	-46.4784	0.17	7.84	0.365	-17.70
19 JAN 1989	7545.50	20 51	53.9	-15-36-58.2	0.7351	0.3086	-33.9183	1.19	9.10	0.134	-12.32
24 JAN 1989	7550.50	20 31	18.8	-15-37-13.2	0.6676	0.3216	-11.7442	2.59	10.02	0.011	-3.92
29 JAN 1989	7555.50	20 6	17.3	-16-36-46.4	0.6671	0.3454	10.3603	1.92	10.02	0.060	9.57
3 FEB 1989	7560.50	19 51	39.3	-17-48-28.8	0.7185	0.3739	23.6304	1.05	9.31	0.206	17.89
8 FEB 1989	7565.50	19 51	19.1	-18-44-18.3	0.7966	0.4022	28.6654	0.60	8.41	0.360	23.05
13 FEB 1989	7570.50	20 2	10.9	-19-13-48.8	0.8798	0.4269	29.1414	0.38	7.60	0.488	25.61
18 FEB 1989	7575.50	20 20	27.2	-19-12-54.6	0.9620	0.4464	27.6056	0.27	6.95	0.588	26.42
23 FEB 1989	7580.50	20 43	26.0	-18-40 -3.1	1.0385	0.4598	25.3068	0.20	6.44	0.663	26.05
28 FEB 1989	7585.50	21 9	26.7	-17-34-40.3	1.1079	0.4661	22.7776	0.12	6.04	0.724	24.86
5 MAR 1989	7590.50	21 37	24.9	-15-56-51.9	1.1700	0.4656	20.1985	0.03	5.72	0.776	23.03
10 MAR 1989	7595.50	22 6	48.3	-13-47 -5.1	1.2245	0.4682	17.5623	-0.10	5.48	0.822	20.66
15 MAR 1989	7600.50	22 37	18.9	-11 -5-58.4	1.2712	0.4441	14.7313	-0.27	5.26	0.865	17.77
20 MAR 1989	7605.50	23 8	53.5	-7-54-22.2	1.3092	0.4238	11.4152	-0.51	5.11	0.906	14.36
25 MAR 1989	7610.50	23 41	39.4	-4-13-32.4	1.3363	0.3984	7.1382	-0.81	5.00	0.946	10.41
30 MAR 1989	7615.50	0 15	51.0	0 -5-53.9	1.3488	0.3700	1.2285	-1.19	4.96	0.980	5.91
4 APR 1989	7620.50	0 51	41.8	4 23 18.3	1.3411	0.3418	-7.0485	-1.63	4.99	0.999	1.22
9 APR 1989	7625.50	1 29	7.5	9 3 5.3	1.3056	0.3190	-17.6424	-1.60	5.12	0.982	-4.85
14 APR 1989	7630.50	2 7	17.3	13 34 0.3	1.2371	0.3079	-29.4910	-1.32	5.41	0.906	-10.30
19 APR 1989	7635.50	2 44	16.0	17 30 45.1	1.1379	0.3122	-38.4554	-0.87	5.88	0.770	-15.17
24 APR 1989	7640.50	3 17	33.6	20 32 40.8	1.0202	0.3303	-42.1560	-0.32	6.55	0.603	-18.75
29 APR 1989	7645.50	3 44	58.0	22 31 38.9	0.8993	0.3568	-40.9061	0.25	7.44	0.439	-20.59
4 MAY 1989	7650.50	4 4	53.6	23 29 10.6	0.7871	0.3857	-36.3228	0.81	8.50	0.295	-20.42
9 MAY 1989	7655.50	4 16	16.6	23 30 5.4	0.6915	0.4127	-29.6089	1.38	9.67	0.175	-18.11
14 MAY 1989	7660.50	4 18	46.9	22 39 54.5	0.6176	0.4355	-21.3138	2.02	10.83	0.081	-13.64
19 MAY 1989	7665.50	4 13	30.7	21 7 45.4	0.5596	0.4525	-11.7993	2.76	11.74	0.021	-7.29
24 MAY 1989	7670.50	4 3	37.0	19 12 39.9	0.5500	0.4630	-1.7218	3.43	12.16	0.001	-1.52
29 MAY 1989	7675.50	3 53	40.7	17 24 23.9	0.5592	0.4667	7.9207	2.71	11.96	0.024	8.12
3 JUN 1989	7680.50	3 47	50.6	16 11 57.5	0.5945	0.4634	16.2998	2.06	11.25	0.082	14.51
8 JUN 1989	7685.50	3 48	27.2	15 50 24.7	0.6519	0.4532	23.1689	1.55	10.26	0.162	19.19
13 JUN 1989	7690.50	3 56	10.8	16 19 12.4	0.7271	0.4365	28.6959	1.13	9.20	0.254	21.98
18 JUN 1989	7695.50	4 10	54.7	17 28 24.8	0.8165	0.4140	33.0714	0.74	8.19	0.358	22.97
23 JUN 1989	7700.50	4 32	25.7	19 4 2.9	0.9169	0.3871	36.2057	0.34	7.29	0.470	22.34
28 JUN 1989	7705.50	5 0	40.7	20 49 43.5	1.0239	0.3582	37.4911	-0.12	6.53	0.598	20.22
3 JUL 1989	7710.50	5 35	38.9	22 25 54.0	1.1305	0.3315	35.6908	-0.62	5.92	0.738	16.70
8 JUL 1989	7715.50	6 16	48.0	23 29 20.1	1.2257	0.3128	29.4177	-1.13	5.46	0.869	11.97
13 JUL 1989	7720.50	7 2	15.0	23 37 19.2	1.2961	0.3078	18.8027	-1.56	5.16	0.965	6.43
18 JUL 1989	7725.50	7 48	44.8	22 38 14.4	1.3328	0.3182	6.6961	-1.77	5.02	0.998	1.57

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1989	7730.50	8 33	7.3	20 37 52.8	1.3368	0.3404	-3.5730	-1.38	5.00	0.978	-5.61
28 JUL 1989	7735.50	9 13	38.4	17 52 44.1	1.3151	0.3085	-10.8177	-0.93	5.08	0.930	-10.64
2 AUG 1989	7740.50	9 49	58.9	14 40 1.5	1.2766	0.3970	-15.5487	-0.55	5.24	0.874	-15.07
7 AUG 1989	7745.50	10 22	21.0	11 13 19.6	1.2269	0.4228	-18.6588	-0.24	5.45	0.816	-18.84
12 AUG 1989	7750.50	10 51	18.0	7 42 32.7	1.1697	0.4431	-20.8514	-0.01	5.72	0.759	-21.96
17 AUG 1989	7755.50	11 17	9.5	4 15 12.0	1.1069	0.4576	-22.5605	0.17	6.04	0.702	-24.42
22 AUG 1989	7760.50	11 40	4.1	0 57 42.9	1.0396	0.4654	-24.0066	0.31	6.43	0.642	-26.18
27 AUG 1989	7765.50	11 59	53.2	-2 -3-21.2	0.9885	0.4682	-25.2297	0.43	6.90	0.574	-27.15
1 SEP 1989	7770.50	12 16	3.9	-4-39-51.9	0.8943	0.4601	-26.0439	0.55	7.48	0.496	-27.12
6 SEP 1989	7775.50	12 27	30.2	-6-40-10.8	0.8189	0.4472	-25.9287	0.71	8.17	0.401	-26.77
11 SEP 1989	7780.50	12 32	28.0	-7-46-43.2	0.7464	0.4280	-23.8114	0.97	8.98	0.286	-22.61
16 SEP 1989	7785.50	12 28	54.5	-7-34-57.7	0.6851	0.4035	-17.8140	1.44	9.76	0.158	-17.01
21 SEP 1989	7790.50	12 16	11.9	-5-43-26.3	0.6496	0.3754	-5.6350	2.25	10.29	0.044	-8.79
26 SEP 1989	7795.50	11 58	35.3	-2-29-38.7	0.6590	0.3468	12.9631	2.86	10.15	0.007	3.29
1 OCT 1989	7800.50	11 45	58.7	0 40 38.9	0.7258	0.3226	32.8373	1.51	9.21	0.103	11.31
6 OCT 1989	7805.50	11 46	46.1	2 11 59.4	0.8420	0.3089	46.0451	0.39	7.94	0.312	16.64
11 OCT 1989	7810.50	12 1	34.6	1 36 16.3	0.9813	0.3102	48.6912	-0.34	8.81	0.551	18.00
16 OCT 1989	7815.50	12 25	45.6	0 -36-50.0	1.1153	0.3261	43.1526	-0.72	8.00	0.745	16.57
21 OCT 1989	7820.50	12 54	30.9	-3-43-30.7	1.2274	0.3514	34.3082	-0.88	5.45	0.870	13.72
26 OCT 1989	7825.50	13 24	59.6	-7-10-13.6	1.3135	0.3802	25.4270	-0.92	5.09	0.941	10.36
31 OCT 1989	7830.50	13 55	59.8	-10-36-59.5	1.3754	0.4079	17.6485	-0.92	4.86	0.978	6.94
5 NOV 1989	7835.50	14 27	11.7	-13-52-52.9	1.4165	0.4316	11.0307	-0.91	4.72	0.995	3.63
10 NOV 1989	7840.50	14 58	36.5	-16-51-43.7	1.4399	0.4498	5.3019	-0.93	4.64	1.000	0.48
15 NOV 1989	7845.50	15 30	22.8	-19-29-34.9	1.4477	0.4616	0.1416	-0.78	4.62	0.998	-2.51
20 NOV 1989	7850.50	16 2	39.0	-21-43-23.0	1.4410	0.4665	-4.7492	-0.64	4.64	0.990	-5.37
25 NOV 1989	7855.50	16 35	29.3	-23-30-17.4	1.4203	0.4646	-9.6241	-0.56	4.71	0.977	-8.13
30 NOV 1989	7860.50	17 8	51.0	-24-47-27.2	1.3852	0.4557	-14.7035	-0.51	4.83	0.957	-10.81
5 DEC 1989	7865.50	17 42	30.3	-25-32 -2.4	1.3350	0.4401	-20.1847	-0.49	5.01	0.927	-13.40
10 DEC 1989	7870.50	18 15	56.3	-25-41-32.0	1.2681	0.4187	-26.2117	-0.49	5.27	0.883	-15.85
15 DEC 1989	7875.50	18 48	10.4	-25-14-32.3	1.1831	0.3924	-32.7744	-0.48	5.65	0.815	-18.04
20 DEC 1989	7880.50	19 17	23.9	-24-12-29.8	1.0788	0.3638	-39.3617	-0.41	6.20	0.709	-19.62
25 DEC 1989	7885.50	19 40	17.3	-22-43-10.6	0.9574	0.3361	-44.1337	-0.20	6.98	0.548	-19.89
30 DEC 1989	7890.50	19 51	15.0	-21 -5-47.9	0.8297	0.3154	-42.7652	0.32	8.06	0.329	-17.54

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	19 43	49.2	-19-50-41.6	0.7221	0.3075	-29.4480	1.38	9.28	0.105	-11.05
9 JAN 1990	7900.50	19 19	10.1	-19-19-32.4	0.6708	0.3151	-5.0407	2.72	9.97	0.008	2.85
14 JAN 1990	7905.50	18 53	24.8	-19-27-58.4	0.6911	0.3358	17.5939	1.58	9.88	0.093	11.46
19 JAN 1990	7910.50	18 41	40.7	-20-1-31.7	0.7815	0.3630	29.3639	0.76	8.78	0.268	19.08
24 JAN 1990	7915.50	18 45	21.6	-20-43-29.9	0.8523	0.3918	32.4201	0.38	7.85	0.433	23.23
29 JAN 1990	7920.50	18 59	54.4	-21-17-42.0	0.9447	0.4181	31.1937	0.19	7.08	0.562	24.92
3 FEB 1990	7925.50	19 21	14.4	-21-32-47.9	1.0309	0.4397	28.3234	0.11	6.49	0.657	25.06
8 FEB 1990	7930.50	19 46	45.2	-21-22-11.0	1.1079	0.4554	24.9842	0.05	6.04	0.729	24.23
13 FEB 1990	7935.50	20 14	53.0	-20-42-14.6	1.1762	0.4644	21.6107	0.00	5.69	0.785	22.74
18 FEB 1990	7940.50	20 44	41.9	-19-31-3.6	1.2328	0.4666	18.3101	-0.08	5.42	0.831	20.74
23 FEB 1990	7945.50	21 15	38.3	-17-47-42.1	1.2809	0.4618	15.0345	-0.19	5.22	0.870	18.30
28 FEB 1990	7950.50	21 47	23.9	-15-31-48.4	1.3195	0.4501	11.6291	-0.35	5.07	0.905	16.45
5 MAR 1990	7955.50	22 19	51.4	-12-43-22.8	1.3477	0.4321	7.8354	-0.57	4.96	0.938	12.16
10 MAR 1990	7960.50	22 53	2.5	-9-22-50.3	1.3640	0.4085	3.2486	-0.85	4.90	0.967	8.43
15 MAR 1990	7965.50	23 27	4.4	-5-31-25.5	1.3852	0.3809	-2.7094	-1.21	4.90	0.990	4.28
20 MAR 1990	7970.50	0 2	3.9	-1-12-26.5	1.3484	0.3520	-10.6865	-1.54	4.97	0.998	-1.58
25 MAR 1990	7975.50	0 37	52.7	3 26 10.3	1.3012	0.3265	-20.9404	-1.49	5.14	0.974	-6.00
30 MAR 1990	7980.50	1 13	42.3	8 8 16.9	1.2243	0.3104	-32.2591	-1.28	5.46	0.893	-11.06
4 APR 1990	7985.50	1 47	40.6	12 28 44.2	1.1171	0.3087	-41.3317	-0.85	5.99	0.749	-15.54
9 APR 1990	7990.50	2 17	7.2	16 0 47.3	0.9910	0.3222	-44.9335	-0.29	6.75	0.565	-18.60
14 APR 1990	7995.50	2 39	29.3	18 26 35.9	0.8632	0.3463	-42.7090	0.35	7.75	0.382	-19.61
19 APR 1990	8000.50	2 53	0.6	19 38 43.0	0.7484	0.3748	-36.2791	1.03	8.94	0.225	-18.17
24 APR 1990	8005.50	2 58	59.7	19 35 29.9	0.6562	0.4030	-27.1937	1.76	10.19	0.104	-14.19
29 APR 1990	8010.50	2 52	26.7	18 21 43.7	0.5929	0.4276	-16.5055	2.60	11.28	0.027	-7.89
4 MAY 1990	8015.50	2 42	39.5	18 16 55.9	0.5614	0.4469	-5.2969	3.52	11.91	0.000	0.48
9 MAY 1990	8020.50	2 32	33.4	13 59 9.2	0.5815	0.4599	5.1069	2.70	11.91	0.023	7.93
14 MAY 1990	8025.50	2 26	31.5	12 10 20.7	0.5891	0.4681	13.6944	2.03	11.35	0.084	14.83
19 MAY 1990	8030.50	2 26	49.6	11 16 3.5	0.6301	0.4655	20.2506	1.55	10.47	0.164	19.94
24 MAY 1990	8035.50	2 33	49.2	11 21 14.7	0.7045	0.4578	25.1414	1.18	9.49	0.252	23.13
29 MAY 1990	8040.50	2 47	0.4	12 18 39.5	0.7827	0.4435	28.8486	0.86	8.54	0.343	24.55
3 JUN 1990	8045.50	3 5	48.9	13 56 48.1	0.8702	0.4231	31.6570	0.56	7.68	0.437	24.45
8 JUN 1990	8050.50	3 29	57.5	16 3 20.7	0.9846	0.3976	33.5023	0.22	6.93	0.538	22.99
13 JUN 1990	8055.50	3 59	30.0	18 25 11.5	1.0823	0.3691	33.8673	-0.18	6.29	0.649	20.30
18 JUN 1990	8060.50	4 34	42.7	20 46 45.5	1.1578	0.3410	31.6860	-0.64	5.78	0.769	16.44
23 JUN 1990	8065.50	5 15	38.1	22 47 57.1	1.2416	0.3185	25.6079	-1.14	5.39	0.886	11.51
28 JUN 1990	8070.50	6 1	16.6	24 4 57.0	1.3015	0.3078	15.2995	-1.60	5.14	0.971	5.80
3 JUL 1990	8075.50	6 49	4.1	24 18 9.6	1.3280	0.3126	3.0108	-1.38	5.04	0.998	-1.38
8 JUL 1990	8080.50	7 35	41.5	23 23 5.7	1.3205	0.3310	-7.7219	-1.39	5.06	0.969	-6.50
13 JUL 1990	8085.50	8 18	43.9	21 30 42.8	1.2868	0.3576	-15.1560	-0.92	5.20	0.907	-11.78
18 JUL 1990	8090.50	8 57	14.7	18 57 60.0	1.2358	0.3865	-19.6549	-0.51	5.41	0.837	-16.32

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	9 31	14.3	16 0 40.1	1.1749	0.4135	-22.2314	-0.18	5.69	0.767	-20.12
28 JUL 1990	8100.50	10 1	2.4	12 51 11.5	1.1084	0.4361	-23.7101	0.07	6.03	0.700	-23.17
2 AUG 1990	8105.50	10 26	57.2	9 39 26.6	1.0386	0.4529	-24.5904	0.27	6.44	0.635	-25.45
7 AUG 1990	8110.50	10 49	4.8	6 33 59.6	0.9667	0.4632	-25.0984	0.44	6.92	0.567	-26.91
12 AUG 1990	8115.50	11 7	13.0	3 43 28.4	0.8940	0.4667	-25.2350	0.59	7.48	0.494	-27.42
17 AUG 1990	8120.50	11 20	45.9	1 18 9.2	0.8216	0.4632	-24.7628	0.75	8.14	0.411	-26.75
22 AUG 1990	8125.50	11 28	38.4	0-28 -8.7	0.7521	0.4528	-23.0910	0.96	8.89	0.315	-24.57
27 AUG 1990	8130.50	11 29	22.4	-1-16-31.8	0.6904	0.4359	-19.1194	1.30	9.69	0.206	-20.41
1 SEP 1990	8135.50	11 21	50.5	0-45-31.0	0.6454	0.4132	-11.2446	1.86	10.36	0.096	-13.95
6 SEP 1990	8140.50	11 7	15.6	1 13 32.4	0.6306	0.3862	1.8451	2.68	10.61	0.018	-5.88
11 SEP 1990	8145.50	10 51	27.4	4 7 42.1	0.6602	0.3573	19.0876	2.51	10.13	0.023	6.12
16 SEP 1990	8150.50	10 43	16.0	6 41 16.4	0.7405	0.3308	35.9465	1.31	9.03	0.139	13.18
21 SEP 1990	8155.50	10 48	31.1	7 46 54.6	0.8620	0.3124	46.8740	0.31	7.76	0.344	17.20
26 SEP 1990	8160.50	11 6	49.8	7 3 6.7	1.0023	0.3078	48.6998	-0.41	6.67	0.576	17.68
1 OCT 1990	8165.50	11 33	47.4	4 47 26.9	1.1356	0.3187	42.6972	-0.83	5.89	0.769	15.57
6 OCT 1990	8170.50	12 4	41.9	1 34 18.1	1.2455	0.3412	33.1915	-1.02	5.37	0.893	12.18
11 OCT 1990	8175.50	12 36	37.8	-2 -4-54.7	1.3274	0.3694	23.6801	-1.08	5.04	0.960	8.36
16 OCT 1990	8180.50	13 8	22.3	-5-49-20.5	1.3836	0.3978	15.4880	-1.08	4.83	0.990	4.58
21 OCT 1990	8185.50	13 39	39.2	-9-27 -2.0	1.4182	0.4233	8.6793	-1.06	4.72	0.999	1.17
26 OCT 1990	8190.50	14 10	35.9	-12-51-16.6	1.4347	0.4437	2.9173	-0.88	4.66	0.998	-2.53
31 OCT 1990	8195.50	14 41	26.2	-15-57-57.5	1.4357	0.4579	-2.1722	-0.68	4.66	0.989	-5.60
5 NOV 1990	8200.50	15 12	23.6	-18-44 -5.7	1.4225	0.4655	-6.9102	-0.53	4.70	0.975	-8.49
10 NOV 1990	8205.50	15 43	38.6	-21 -7 -3.3	1.3959	0.4661	-11.5698	-0.43	4.79	0.955	-11.22
15 NOV 1990	8210.50	16 15	12.9	-23 -4 -8.0	1.3556	0.4598	-16.3723	-0.37	4.93	0.929	-13.78
20 NOV 1990	8215.50	16 46	57.7	-24-32-27.7	1.3010	0.4467	-21.4857	-0.34	5.14	0.894	-16.17
25 NOV 1990	8220.50	17 18	25.1	-25-29 -7.2	1.2311	0.4274	-27.0077	-0.33	5.43	0.844	-18.32
30 NOV 1990	8225.50	17 48	36.4	-25-51-35.9	1.1447	0.4027	-32.8532	-0.31	5.84	0.771	-20.07
5 DEC 1990	8230.50	18 15	37.7	-25-38-51.2	1.0415	0.3745	-36.4489	-0.24	6.42	0.663	-21.06
10 DEC 1990	8235.50	18 35	58.1	-24-53-15.7	0.9245	0.3460	-41.9911	-0.03	7.23	0.504	-20.57
15 DEC 1990	8240.50	18 43	45.4	-23-42-54.9	0.8050	0.3220	-39.2485	0.50	8.31	0.290	-17.28
20 DEC 1990	8245.50	18 32	36.2	-22-20-42.1	0.7098	0.3067	-24.3023	1.60	9.42	0.079	-9.75
25 DEC 1990	8250.50	18 5	31.4	-21 -1-52.4	0.6758	0.3105	1.9458	2.69	9.89	0.006	2.91
30 DEC 1990	8255.50	17 41	6.4	-20-14-39.4	0.7157	0.3268	24.1829	1.30	9.34	0.128	12.83

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1991	8260.50	17 33	12.3	-20-19-30.6	0.8031	0.3523	34.3755	0.51	8.33	0.325	19.62
9 JAN 1991	8265.50	17 40	48.8	-21 0-34.9	0.9057	0.3811	35.8145	0.15	7.38	0.499	22.80
14 JAN 1991	8270.50	17 58	33.6	-21-51-2.1	1.0051	0.4087	32.8589	0.01	6.65	0.628	23.69
19 JAN 1991	8275.50	18 22	24.0	-22-31-47.6	1.0942	0.4323	28.7911	-0.05	6.11	0.720	23.24
24 JAN 1991	8280.50	18 49	56.3	-22-51-52.8	1.1712	0.4502	24.5110	-0.09	5.71	0.787	21.99
29 JAN 1991	8285.50	19 19	47.8	-22-45-12.3	1.2369	0.4618	20.3852	-0.13	5.41	0.838	20.23
3 FEB 1991	8290.50	19 51	8.7	-22-8-17.7	1.2891	0.4686	16.4571	-0.19	5.19	0.877	18.09
8 FEB 1991	8295.50	20 23	28.3	-20-59-4.4	1.3311	0.4844	12.6315	-0.29	5.02	0.910	15.61
13 FEB 1991	8300.50	20 56	27.5	-19-16-18.3	1.3620	0.4553	8.7407	-0.44	4.91	0.938	12.80
18 FEB 1991	8305.50	21 29	55.4	-16-59-17.1	1.3813	0.4398	4.5368	-0.63	4.84	0.963	9.67
23 FEB 1991	8310.50	22 3	47.7	-14-7-45.1	1.3876	0.4179	-0.3306	-0.90	4.82	0.983	6.20
28 FEB 1991	8315.50	22 38	4.3	-10-42-8.1	1.3783	0.3915	-6.3400	-1.22	4.85	0.997	2.65
5 MAR 1991	8320.50	23 12	43.9	-6-44-25.3	1.3493	0.3628	-14.0535	-1.40	4.96	0.995	-3.02
10 MAR 1991	8325.50	23 47	32.0	-2-20-15.9	1.2951	0.3354	-23.7634	-1.36	5.16	0.963	-7.36
15 MAR 1991	8330.50	0 21	37.0	2 17 13.3	1.2109	0.3150	-34.5947	-1.18	5.52	0.878	-11.97
20 MAR 1991	8335.50	0 53	3.3	6 44 7.7	1.0971	0.3075	-43.5824	-0.81	6.10	0.727	-15.97
25 MAR 1991	8340.50	1 18	54.9	10 28 56.5	0.9846	0.3156	-46.9967	-0.25	6.93	0.529	-18.42
30 MAR 1991	8345.50	1 38	11.9	13 3 11.8	0.8323	0.3364	-43.6115	0.47	8.03	0.329	-18.46
4 APR 1991	8350.50	1 43	2.6	14 8 36.6	0.7179	0.3639	-34.9383	1.28	9.32	0.163	-15.60
9 APR 1991	8355.50	1 39	42.1	13 38 53.4	0.6335	0.3927	-23.1000	2.20	10.56	0.051	-9.89
14 APR 1991	8360.50	1 29	22.5	11 47 39.5	0.5855	0.4189	-10.1349	3.17	11.42	0.003	-2.70
19 APR 1991	8365.50	1 17	40.4	9 16 27.5	0.5741	0.4403	1.8789	2.72	11.65	0.020	7.10
24 APR 1991	8370.50	1 9	55.0	6 59 31.7	0.5940	0.4558	11.4389	2.01	11.26	0.084	14.55
29 APR 1991	8375.50	1 8	51.1	5 34 35.0	0.6375	0.4646	18.2372	1.51	10.49	0.169	20.25
4 MAY 1991	8380.50	1 14	45.7	5 13 17.2	0.6972	0.4665	22.8255	1.16	9.59	0.260	23.94
9 MAY 1991	8385.50	1 26	47.8	5 51 3.1	0.7679	0.4615	25.9386	0.89	8.71	0.347	26.81
14 MAY 1991	8390.50	1 43	58.0	7 17 47.1	0.8461	0.4496	28.1180	0.65	7.90	0.432	26.16
19 MAY 1991	8395.50	2 5	35.3	9 22 58.8	0.9296	0.4314	29.6197	0.40	7.19	0.517	25.23
24 MAY 1991	8400.50	2 31	22.6	11 56 52.3	1.0165	0.4077	30.3807	0.12	6.58	0.605	23.18
29 MAY 1991	8405.50	3 1	26.7	14 49 42.8	1.1040	0.3800	29.9462	-0.23	6.06	0.700	20.09
3 JUN 1991	8410.50	3 36	10.8	17 49 58.9	1.1874	0.3512	27.3998	-0.66	5.63	0.803	16.00
8 JUN 1991	8415.50	4 15	57.4	20 41 42.4	1.2590	0.3259	21.4960	-1.14	5.31	0.903	10.97
13 JUN 1991	8420.50	5 0	29.9	23 3 16.4	1.3076	0.3101	11.5840	-1.62	5.11	0.978	5.18
18 JUN 1991	8425.50	5 48	5.8	24 31 1.8	1.3235	0.3090	-0.7306	-1.85	5.05	0.998	-1.49
23 JUN 1991	8430.50	6 35	45.1	24 50 33.4	1.3045	0.3228	-11.9110	-1.40	5.13	0.959	-7.24
28 JUN 1991	8435.50	7 20	35.3	24 4 3.1	1.2581	0.3471	-19.6184	-0.92	5.32	0.884	-12.65
3 JUL 1991	8440.50	8 0	59.6	22 25 11.8	1.1945	0.3757	-23.9263	-0.48	5.60	0.798	-17.27
8 JUL 1991	8445.50	8 36	29.5	20 10 16.9	1.1221	0.4038	-25.9338	-0.12	5.96	0.714	-21.03
13 JUL 1991	8450.50	9 7	9.2	17 33 49.5	1.0460	0.4282	-26.6230	0.16	6.39	0.636	-23.91
18 JUL 1991	8455.50	9 33	7.4	14 48 1.9	0.9691	0.4474	-26.5720	0.39	6.90	0.561	-25.90

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23 JUL 1991	8460.50	9 54 23.8	12 3 45.5	0.8930	0.4802	-26.0169	0.59	7.49	0.486	-26.92
28 JUL 1991	8465.50	10 10 40.1	9 31 52.3	0.8193	0.4862	-24.9209	0.77	8.16	0.407	-26.81
2 AUG 1991	8470.50	10 21 16.2	7 24 44.3	0.7499	0.4653	-22.9723	0.99	8.92	0.320	-26.33
7 AUG 1991	8475.50	10 25 12.7	5 57 32.2	0.6881	0.4575	-19.5343	1.28	9.72	0.225	-22.14
12 AUG 1991	8480.50	10 21 32.8	5 27 58.5	0.6395	0.4430	-13.6060	1.72	10.46	0.128	-16.96
17 AUG 1991	8485.50	10 10 29.3	6 9 58.9	0.6130	0.4223	-4.1011	2.36	10.91	0.045	-9.96
22 AUG 1991	8490.50	9 55 13.8	7 58 20.6	0.6195	0.3987	9.1688	2.92	10.79	0.010	4.41
27 AUG 1991	8495.50	9 42 26.2	10 15 55.0	0.6678	0.3682	24.3933	2.14	10.01	0.053	9.41
1 SEP 1991	8500.50	9 39 12.2	12 8 3.7	0.7590	0.3401	38.1555	1.11	8.81	0.183	15.12
6 SEP 1991	8505.50	9 49 3.8	12 51 55.5	0.8833	0.3180	46.8660	0.23	7.57	0.380	17.83
11 SEP 1991	8510.50	10 10 59.8	12 8 12.5	1.0222	0.3077	47.9381	-0.46	6.54	0.600	17.42
16 SEP 1991	8515.50	10 40 59.2	10 1 1.0	1.1530	0.3130	41.6621	-0.92	5.80	0.788	14.73
21 SEP 1991	8520.50	11 14 28.6	6 52 48.4	1.2592	0.3318	31.6242	-1.15	5.31	0.911	10.83
26 SEP 1991	8525.50	11 48 22.2	3 11 10.0	1.3356	0.3585	21.5181	-1.23	5.01	0.974	6.59
1 OCT 1991	8530.50	12 21 20.4	0-42-21.5	1.3850	0.3874	12.9495	-1.23	4.83	0.997	2.60
6 OCT 1991	8535.50	12 53 8.2	-4-34-19.4	1.4120	0.4143	6.0100	-1.08	4.74	0.998	-2.03
11 OCT 1991	8540.50	13 23 57.2	-8-16-58.4	1.4209	0.4367	0.2972	-0.80	4.71	0.989	-5.33
16 OCT 1991	8545.50	13 54 6.5	-11-45-40.7	1.4145	0.4533	-4.8277	-0.59	4.73	0.973	-8.54
21 OCT 1991	8550.50	14 23 53.7	-14-57-17.0	1.3946	0.4634	-9.1263	-0.43	4.80	0.952	-11.49
26 OCT 1991	8555.50	14 53 32.5	-17-49-12.3	1.3619	0.4667	-13.4761	-0.31	4.91	0.926	-14.19
31 OCT 1991	8560.50	15 23 8.8	-20-18-53.9	1.3167	0.4630	-17.8963	-0.24	5.08	0.895	-16.64
5 NOV 1991	8565.50	15 52 36.8	-22-23-32.9	1.2583	0.4524	-22.5424	-0.20	5.31	0.853	-18.83
10 NOV 1991	8570.50	16 21 31.6	-23-59-58.0	1.1862	0.4353	-27.4643	-0.18	5.64	0.798	-20.66
15 NOV 1991	8575.50	16 48 55.2	-25-4-37.9	1.0998	0.4125	-32.5118	-0.15	6.08	0.721	-21.97
20 NOV 1991	8580.50	17 12 51.7	-25-33-52.7	0.9989	0.3853	-37.0408	-0.06	6.69	0.610	-22.36
25 NOV 1991	8585.50	17 29 46.2	-26-24-4.7	0.8878	0.3585	-39.2254	0.16	7.53	0.453	-21.07
30 NOV 1991	8590.50	17 33 50.4	-24-30-57.9	0.7785	0.3301	-34.9595	0.70	8.59	0.249	-16.83
5 DEC 1991	8595.50	17 19 31.5	-22-49-50.5	0.6978	0.3121	-18.5793	1.84	9.58	0.056	-8.35
10 DEC 1991	8600.50	16 52 4.7	-20-37-25.2	0.6817	0.3080	8.1162	2.53	9.81	0.011	3.79
15 DEC 1991	8605.50	16 30 51.1	-19-2-31.6	0.7397	0.3192	30.0093	1.07	9.04	0.162	13.81
20 DEC 1991	8610.50	16 27 14.4	-18-51-54.6	0.8418	0.3421	38.6636	0.30	7.94	0.376	19.69
25 DEC 1991	8615.50	16 38 26.2	-19-43-0.8	0.9543	0.3703	38.2787	-0.03	7.01	0.557	21.96
30 DEC 1991	8620.50	16 58 47.6	-20-57-43.3	1.0594	0.3987	34.1514	-0.16	6.31	0.686	22.11

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1992	8625.50	17 24	30.7	-22-10-20.4	1.1507	0.4240	29.0077	-0.21	5.81	0.775	21.10
9 JAN 1992	8630.50	17 53	28.5	-23-6-32.2	1.2270	0.4442	23.8912	-0.23	5.45	0.837	19.47
14 JAN 1992	8635.50	18 24	30.6	-23-38-22.7	1.2890	0.4583	19.0973	-0.25	5.19	0.883	17.45
19 JAN 1992	8640.50	18 50	55.8	-23-41-13.0	1.3376	0.4658	14.8249	-0.31	5.00	0.917	15.17
24 JAN 1992	8645.50	19 30	17.4	-23-12-5.9	1.3736	0.4660	10.3433	-0.39	4.87	0.943	12.65
29 JAN 1992	8650.50	20 4	17.0	-22-9-0.1	1.3973	0.4595	6.0588	-0.52	4.79	0.965	9.90
3 FEB 1992	8655.50	20 38	41.3	-20-30-31.9	1.4084	0.4462	1.5254	-0.71	4.75	0.982	6.94
8 FEB 1992	8660.50	21 13	20.4	-18-15-48.1	1.4056	0.4267	-3.5827	-0.94	4.78	0.994	3.86
13 FEB 1992	8665.50	21 48	6.9	-15-24-33.5	1.3869	0.4019	-9.6124	-1.18	4.82	0.998	-2.07
18 FEB 1992	8670.50	22 22	51.0	-11-57-50.5	1.3487	0.3736	-17.0832	-1.24	4.96	0.987	-4.87
23 FEB 1992	8675.50	22 57	9.5	-7-59-40.5	1.2885	0.3452	-26.2540	-1.22	5.20	0.948	-8.92
28 FEB 1992	8680.50	23 30	4.8	-3-40-37.6	1.1960	0.3214	-36.4856	-1.08	5.59	0.859	-13.04
4 MAR 1992	8685.50	23 59	33.5	0 37 17.0	1.0772	0.3085	-45.1890	-0.76	6.21	0.705	-16.49
9 MAR 1992	8690.50	0 22	18.8	4 19 25.9	0.9406	0.3108	-48.2538	-0.19	7.11	0.498	-18.24
14 MAR 1992	8695.50	0 34	48.8	6 47 10.5	0.8062	0.3275	-43.5132	0.59	8.29	0.281	-17.22
19 MAR 1992	8700.50	0 35	12.3	7 31 22.3	0.6956	0.3532	-32.2064	1.55	9.61	0.111	-12.86
24 MAR 1992	8705.50	0 25	17.1	6 26 22.5	0.6236	0.3820	-17.4285	2.64	10.72	0.018	-5.84
29 MAR 1992	8710.50	0 11	1.2	4 5 10.5	0.5949	0.4095	-2.7499	2.83	11.24	0.012	5.14
3 APR 1992	8715.50	23 59	37.7	1 30 57.6	0.6047	0.4329	8.9688	2.04	11.06	0.073	13.05
8 APR 1992	8720.50	23 55	27.8	0-22-33.0	0.6429	0.4507	16.8393	1.48	10.40	0.167	19.60
13 APR 1992	8725.50	23 59	14.3	-1-13-33.2	0.6990	0.4821	21.5966	1.11	9.57	0.265	24.00
18 APR 1992	8730.50	0 9	48.9	-1-2-38.5	0.7657	0.4666	24.3438	0.86	8.73	0.357	26.44
23 APR 1992	8735.50	0 25	44.3	0 1 40.6	0.8385	0.4842	25.9180	0.66	7.98	0.441	27.28
28 APR 1992	8740.50	0 45	52.0	1 50 3.7	0.9147	0.4549	26.8076	0.48	7.31	0.518	26.84
3 MAY 1992	8745.50	1 9	30.3	4 14 20.1	0.9928	0.4390	27.2016	0.28	6.74	0.593	25.33
8 MAY 1992	8750.50	1 36	23.2	7 7 24.2	1.0713	0.4171	27.0161	0.03	6.24	0.669	22.88
13 MAY 1992	8755.50	2 6	36.5	10 22 23.5	1.1479	0.3907	25.8610	-0.29	5.83	0.750	19.55
18 MAY 1992	8760.50	2 40	33.6	13 51 11.7	1.2190	0.3618	22.9535	-0.68	5.49	0.836	15.34
23 MAY 1992	8765.50	3 18	44.3	17 22 10.1	1.2777	0.3348	17.1735	-1.14	5.23	0.921	10.29
28 MAY 1992	8770.50	4 1	18.2	20 37 32.2	1.3145	0.3145	7.7057	-1.63	5.09	0.984	4.52
2 JUN 1992	8775.50	4 47	20.7	23 13 42.7	1.3196	0.3075	-4.4604	-1.85	5.07	0.997	-1.84
7 JUN 1992	8780.50	5 34	30.0	24 49 21.5	1.2894	0.3181	-16.0269	-1.41	5.19	0.949	-7.86
12 JUN 1992	8785.50	6 19	50.9	25 16 40.5	1.2305	0.3372	-24.0791	-0.92	5.43	0.859	-13.34
17 JUN 1992	8790.50	7 1	14.0	24 42 51.7	1.1541	0.3648	-28.2553	-0.45	5.79	0.757	-17.94
22 JUN 1992	8795.50	7 37	37.4	23 22 23.3	1.0899	0.3935	-29.6798	-0.06	6.25	0.658	-21.55
27 JUN 1992	8800.50	8 8	41.1	21 30 29.9	0.9842	0.4196	-29.4931	0.26	6.79	0.567	-24.14
2 JUL 1992	8805.50	8 34	17.5	19 21 3.6	0.9005	0.4409	-28.3864	0.53	7.43	0.482	-25.68
7 JUL 1992	8810.50	8 54	13.8	17 6 48.5	0.8209	0.4561	-26.6141	0.77	8.15	0.399	-26.06
12 JUL 1992	8815.50	9 8	2.3	15 0 22.6	0.7475	0.4648	-24.0938	1.01	8.95	0.314	-25.11
17 JUL 1992	8820.50	9 15	0.8	13 15 21.8	0.6828	0.4685	-20.4583	1.30	9.79	0.226	-22.58

GEOCENTRIC EPHEMERIS FOR MERCURY

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22 JUL 1992	8825.50	9 14	27.4	12 6	31.5	0.6310	-15.0862	1.69	10.60	0.138	-18.25
27 JUL 1992	8830.50	9 6	24.9	11 47	20.8	0.5980	-7.2718	2.24	11.18	0.061	-12.20
1 AUG 1992	8835.50	8 52	57.0	12 22	58.9	0.5917	3.2838	2.86	11.30	0.015	-5.89
6 AUG 1992	8840.50	8 38	57.1	13 41	38.2	0.6190	15.8358	2.65	10.80	0.023	6.96
11 AUG 1992	8845.50	8 30	44.4	15 15	24.4	0.6833	28.5805	1.77	9.79	0.098	12.85
16 AUG 1992	8850.50	8 33	6.5	16 32	10.7	0.7822	39.3809	0.92	8.55	0.235	17.05
21 AUG 1992	8855.50	8 47	43.1	17 4	28.4	0.9088	46.0508	0.16	7.37	0.419	18.50
26 AUG 1992	8860.50	9 13	19.4	18 31	52.7	1.0420	46.4402	-0.50	6.42	0.624	17.28
31 AUG 1992	8865.50	9 46	29.5	14 46	2.1	1.1683	40.0542	-0.99	5.72	0.808	14.03
5 SEP 1992	8870.50	10 22	55.9	11 58	17.7	1.2694	29.6343	-1.26	5.27	0.926	9.67
10 SEP 1992	8875.50	10 59	19.3	8 24	21.8	1.3393	18.9678	-1.37	4.99	0.983	5.07
15 SEP 1992	8880.50	11 34	5.3	4 31	55.1	1.3807	10.0241	-1.34	4.84	0.999	-1.60
20 SEP 1992	8885.50	12 6	55.5	0 34	17.7	1.3991	2.9977	-1.03	4.78	0.991	-4.26
25 SEP 1992	8890.50	12 38	4.3	-3-19	-6.6	1.3994	-2.5900	-0.74	4.78	0.973	-7.91
30 SEP 1992	8895.50	13 7	55.1	-7	-2-37.8	1.3850	-7.2622	-0.50	4.83	0.950	-11.26
5 OCT 1992	8900.50	13 36	49.7	-10-32-33.7	1.3580	0.4605	-11.4253	-0.33	4.92	0.922	-14.27
10 OCT 1992	8905.50	14 5	4.0	-13-46-3.1	1.3192	0.4663	-15.3773	-0.20	5.07	0.891	-16.96
15 OCT 1992	8910.50	14 32	45.9	-16-40-28.1	1.2691	0.4652	-19.3256	-0.12	5.27	0.853	-19.31
20 OCT 1992	8915.50	14 59	51.1	-19-12-55.6	1.2075	0.4571	-23.4012	-0.07	5.54	0.808	-21.29
25 OCT 1992	8920.50	15 25	55.5	-21-19-53.0	1.1338	0.4424	-27.6233	-0.03	5.90	0.746	-22.81
30 OCT 1992	8925.50	15 50	1.6	-22-56-43.4	1.0480	0.4216	-31.7756	0.02	6.38	0.664	-23.65
4 NOV 1992	8930.50	16 10	13.6	-23-57-0.9	0.9511	0.3959	-35.1341	0.12	7.03	0.552	-23.40
9 NOV 1992	8935.50	16 23	0.6	-24-10-52.3	0.8476	0.3673	-35.8379	0.37	7.89	0.397	-21.28
14 NOV 1992	8940.50	16 23	3.4	-23-22-13.6	0.7504	0.3393	-29.9326	0.94	8.91	0.205	-16.08
19 NOV 1992	8945.50	16 6	26.8	-21-13-56.7	0.6861	0.3174	-12.3662	2.13	9.75	0.035	-6.79
24 NOV 1992	8950.50	15 40	33.5	-18-14-18.4	0.6882	0.3077	14.2321	2.34	9.72	0.020	5.02
29 NOV 1992	8955.50	15 23	42.1	-16-8-13.9	0.7624	0.3134	35.0037	0.88	8.77	0.193	14.52
4 DEC 1992	8960.50	15 24	23.4	-15-55-1.5	0.8769	0.3325	42.2333	0.12	7.63	0.421	19.46
9 DEC 1992	8965.50	15 38	44.2	-17-3-20.6	0.9976	0.3594	40.4158	-0.21	6.70	0.608	20.88
14 DEC 1992	8970.50	16 1	10.5	-18-48-16.0	1.1070	0.3883	35.0582	-0.33	6.04	0.737	20.33
19 DEC 1992	8975.50	16 28	12.4	-20-33-15.2	1.1994	0.4150	28.9496	-0.36	5.58	0.823	18.79
24 DEC 1992	8980.50	16 58	0.5	-22-7-37.3	1.2745	0.4373	23.0927	-0.37	5.25	0.880	16.77
29 DEC 1992	8985.50	17 29	37.9	-23-20-13.4	1.3333	0.4538	17.7255	-0.39	5.02	0.920	14.50

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3 JAN 1993	8990.50	18 2 33.1	-24 5-38.9	1.3773	0.4637	12.7933	-0.43	4.86	0.948	12.06	
8 JAN 1993	8995.50	18 36 25.6	-24-20-11.4	1.4074	0.4667	8.1379	-0.50	4.75	0.969	9.50	
13 JAN 1993	9000.50	19 10 59.8	-24 -1-18.4	1.4243	0.4627	3.5508	-0.62	4.69	0.984	6.82	
18 JAN 1993	9005.50	19 46 2.3	-23 -6-54.0	1.4278	0.4519	-1.2180	-0.78	4.68	0.994	4.11	
23 JAN 1993	9010.50	20 21 19.8	-21-35-25.4	1.4168	0.4347	-6.4533	-0.97	4.72	0.998	-2.10	
28 JAN 1993	9015.50	20 56 38.2	-19-26-57.2	1.3897	0.4117	-12.4974	-1.05	4.81	0.994	-3.66	
2 FEB 1993	9020.50	21 31 39.0	-16-38-42.2	1.3435	0.3845	-19.7287	-1.07	4.98	0.975	-6.98	
7 FEB 1993	9025.50	22 5 49.6	-13-18-25.6	1.2744	0.3556	-28.3700	-1.06	5.25	0.929	-10.67	
12 FEB 1993	9030.50	22 38 2.8	-9-27-36.5	1.1787	0.3294	-37.9180	-0.96	5.67	0.837	-14.27	
17 FEB 1993	9035.50	23 6 4.2	-5-31-58.1	1.0567	0.3117	-46.0872	-0.88	6.33	0.680	-17.12	
22 FEB 1993	9040.50	23 26 12.4	-2 -5 -9.4	0.9180	0.3081	-48.6600	-0.13	7.28	0.464	-18.10	
27 FEB 1993	9045.50	23 34 17.4	0 6 19.8	0.7843	0.3198	-42.3701	0.72	8.53	0.237	-15.95	
4 MAR 1993	9050.50	23 28 34.9	0 25 11.2	0.6810	0.3429	-28.1417	1.83	9.82	0.070	-10.15	
9 MAR 1993	9055.50	23 13 0.8	-1 -7 -3.4	0.6251	0.3712	-10.5431	2.88	10.70	0.007	3.63	
14 MAR 1993	9060.50	22 56 32.0	-3-35-32.9	0.6180	0.3998	4.9698	2.22	10.82	0.048	9.86	
19 MAR 1993	9065.50	22 46 56.5	-5-49-50.1	0.6488	0.4247	15.4487	1.51	10.31	0.146	17.55	
24 MAR 1993	9070.50	22 46 47.2	-7-10-59.2	0.7027	0.4448	21.2621	1.08	9.52	0.258	22.98	
29 MAR 1993	9075.50	22 54 58.8	-7-31-58.0	0.7687	0.4586	24.0347	0.81	8.70	0.361	26.18	
3 APR 1993	9080.50	23 9 29.3	-6-58-39.6	0.8400	0.4657	25.1350	0.63	7.96	0.451	27.61	
8 APR 1993	9085.50	23 28 35.2	-5-39 -0.1	0.9130	0.4659	25.3775	0.49	7.32	0.528	27.68	
13 APR 1993	9090.50	23 51 6.8	-3-39-51.6	0.9861	0.4592	25.1529	0.34	6.78	0.598	26.68	
18 APR 1993	9095.50	0 16 23.8	-1 -6-49.7	1.0580	0.4457	24.5801	0.16	6.32	0.664	24.79	
23 APR 1993	9100.50	0 44 10.2	1 55 21.8	1.1278	0.4260	23.5581	-0.06	5.93	0.730	22.09	
28 APR 1993	9105.50	1 14 29.9	5 22 9.4	1.1933	0.4010	21.7370	-0.34	5.60	0.798	18.64	
3 MAY 1993	9110.50	1 47 42.4	9 8 7.9	1.2518	0.3727	18.4582	-0.71	5.34	0.870	14.42	
8 MAY 1993	9115.50	2 24 16.6	13 5 14.0	1.2975	0.3443	12.7456	-1.15	5.15	0.938	9.44	
13 MAY 1993	9120.50	3 4 33.5	17 0 4.2	1.3221	0.3208	3.7186	-1.63	5.06	0.989	3.76	
18 MAY 1993	9125.50	3 48 10.7	20 31 56.2	1.3162	0.3083	-8.1404	-1.81	5.08	0.995	-2.36	
23 MAY 1993	9130.50	4 33 28.1	23 16 40.6	1.2751	0.3111	-19.9628	-1.41	5.24	0.940	-8.42	
28 MAY 1993	9135.50	5 17 47.9	24 57 54.0	1.2043	0.3281	-28.4042	-0.92	5.55	0.836	-13.88	
2 JUN 1993	9140.50	5 58 44.7	25 34 23.4	1.1153	0.3541	-32.5103	-0.43	6.00	0.716	-18.36	
7 JUN 1993	9145.50	6 34 47.8	25 16 13.2	1.0197	0.3829	-33.3332	0.01	6.56	0.600	-21.70	
12 JUN 1993	9150.50	7 5 9.8	24 17 26.5	0.9247	0.4103	-32.1788	0.38	7.23	0.495	-23.83	
17 JUN 1993	9155.50	7 29 20.9	22 52 9.8	0.8349	0.4336	-29.8553	0.70	8.01	0.398	-24.70	
22 JUN 1993	9160.50	7 46 51.2	21 13 43.9	0.7531	0.4512	-26.8563	1.00	8.88	0.307	-24.18	
27 JUN 1993	9165.50	7 57 3.4	19 35 5.8	0.6819	0.4623	-22.4774	1.32	9.81	0.219	-22.09	
2 JUL 1993	9170.50	7 59 24.1	18 9 10.9	0.6248	0.4668	-16.9446	1.72	10.71	0.135	-18.27	
7 JUL 1993	9175.50	7 53 58.2	17 8 18.2	0.5858	0.4640	-9.6215	2.24	11.42	0.063	-12.81	
12 JUL 1993	9180.50	7 42 29.3	16 41 44.2	0.5709	0.4545	-0.3565	2.84	11.71	0.017	-6.70	
17 JUL 1993	9185.50	7 28 59.2	16 52 2.4	0.5851	0.4384	10.3373	2.89	11.43	0.014	5.84	

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1993	9190.50	7 18 53.2	17 33 0.1	0.6309	0.4184	21.3367	2.18	10.60	0.061	11.34
27 JUL 1993	9195.50	7 16 48.3	18 31 7.6	0.7075	0.3898	31.4455	1.44	9.45	0.157	16.20
1 AUG 1993	9200.50	7 25 10.8	19 28 25.1	0.8107	0.3609	39.6034	0.75	8.25	0.293	18.88
6 AUG 1993	9205.50	7 44 27.1	20 3 50.3	0.9331	0.3338	44.4758	0.08	7.17	0.463	19.16
11 AUG 1993	9210.50	8 13 31.5	19 54 58.0	1.0628	0.3141	44.2497	-0.53	6.29	0.650	17.19
16 AUG 1993	9215.50	8 49 45.6	18 44 1.8	1.1828	0.3076	37.8958	-1.04	5.65	0.822	13.45
21 AUG 1993	9220.50	9 29 18.7	16 27 46.0	1.2773	0.3166	27.2589	-1.36	5.24	0.938	8.69
26 AUG 1993	9225.50	10 8 38.1	13 19 46.5	1.3396	0.3380	16.0742	-1.50	4.99	0.990	3.80
31 AUG 1993	9230.50	10 45 46.3	9 40 29.6	1.3720	0.3657	6.7418	-1.38	4.87	0.997	-2.33
5 SEP 1993	9235.50	11 20 13.3	5 47 15.1	1.3807	0.3944	-0.3650	-1.00	4.84	0.980	-6.30
10 SEP 1993	9240.50	11 52 13.4	1 51 40.6	1.3715	0.4204	-5.7694	-0.68	4.88	0.953	-10.22
15 SEP 1993	9245.50	12 22 13.4	-1 58 55.6	1.3484	0.4414	-10.0998	-0.43	4.96	0.921	-13.72
20 SEP 1993	9250.50	12 50 38.6	-5 39 47.3	1.3137	0.4585	-13.8360	-0.24	5.09	0.886	-16.80
25 SEP 1993	9255.50	13 17 47.5	-9 7 23.7	1.2687	0.4649	-17.2955	-0.10	5.27	0.848	-19.47
30 SEP 1993	9260.50	13 43 48.8	-12 18 37.9	1.2139	0.4664	-20.6825	0.00	5.51	0.804	-21.71
5 OCT 1993	9265.50	14 8 38.0	-16 10 10.8	1.1493	0.4609	-24.0993	0.07	5.82	0.752	-23.47
10 OCT 1993	9270.50	14 31 50.2	-17 37 51.1	1.0747	0.4487	-27.6158	0.12	6.22	0.688	-24.65
15 OCT 1993	9275.50	14 52 26.8	-19 35 39.4	0.9906	0.4301	-30.6802	0.19	6.75	0.601	-24.99
20 OCT 1993	9280.50	15 8 33.6	-20 54 10.7	0.8988	0.4060	-32.7282	0.32	7.44	0.487	-24.06
25 OCT 1993	9285.50	15 16 52.7	-21 17 35.1	0.8044	0.3782	-31.8137	0.61	8.31	0.337	-21.07
30 OCT 1993	9290.50	15 12 58.0	-20 20 46.4	0.7213	0.3494	-24.2031	1.23	9.27	0.159	-14.92
4 NOV 1993	9295.50	14 55 2.3	-17 43 25.2	0.6752	0.3246	-5.7910	2.45	9.90	0.018	-5.04
9 NOV 1993	9300.50	14 32 2.0	-14 12 47.7	0.6953	0.3096	19.8846	2.13	9.62	0.033	6.44
14 NOV 1993	9305.50	14 19 58.2	-11 54 52.3	0.7835	0.3094	39.1147	0.73	8.53	0.222	15.08
19 NOV 1993	9310.50	14 24 42.1	-11 48 49.7	0.9080	0.3241	45.0668	-0.03	7.36	0.460	19.08
24 NOV 1993	9315.50	14 41 49.7	-13 17 20.8	1.0352	0.3488	42.0253	-0.37	6.46	0.651	19.68
29 NOV 1993	9320.50	15 5 59.5	-15 28 38.6	1.1475	0.3775	35.5573	-0.49	5.83	0.781	18.46
4 DEC 1993	9325.50	15 33 58.0	-17 49 9.2	1.2401	0.4054	28.5768	-0.52	5.39	0.863	16.41
9 DEC 1993	9330.50	16 4 10.7	-20 0 38.9	1.3131	0.4298	22.0768	-0.52	5.09	0.916	14.00
14 DEC 1993	9335.50	16 35 53.5	-21 53 13.8	1.3682	0.4483	16.2295	-0.53	4.89	0.950	11.46
19 DEC 1993	9340.50	17 8 45.3	-23 21 2.1	1.4073	0.4607	10.9326	-0.56	4.75	0.972	8.85
24 DEC 1993	9345.50	17 42 33.6	-24 20 4.2	1.4317	0.4684	5.9934	-0.62	4.67	0.987	6.23
29 DEC 1993	9350.50	18 17 8.2	-24 47 15.9	1.4421	0.4650	1.1893	-0.72	4.64	0.995	3.67

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	18 52	18.2	-24.40	-2.4	1.4385	-3.7223	-0.84	4.65	0.999	1.84
8 JAN 1994	9360.50	19 27	50.1	-23.58	-12.5	1.4202	-9.0168	-0.88	4.71	0.996	-3.23
13 JAN 1994	9365.50	20 3	25.9	-22.34	-8.0	1.3858	-14.9940	-0.89	4.83	0.984	-6.10
18 JAN 1994	9370.50	20 38	39.7	-20.33	-11.7	1.3327	-21.9539	-0.91	5.02	0.958	-9.29
23 JAN 1994	9375.50	21 12	48.9	-17.54	-58.7	1.2578	-30.0619	-0.90	5.32	0.906	-12.58
28 JAN 1994	9380.50	21 44	35.2	-14.46	-4.9	1.1583	-38.8680	-0.83	5.77	0.810	-15.84
2 FEB 1994	9385.50	22 11	29.2	-11.23	-34.1	1.0346	-46.3370	-0.58	6.46	0.652	-17.84
7 FEB 1994	9390.50	22 29	21.4	-8.21	-43.2	0.8961	-48.2028	-0.05	7.46	0.432	-18.00
12 FEB 1994	9395.50	22 33	18.8	-6.30	-27.9	0.7658	-40.2211	0.86	8.73	0.199	-14.69
17 FEB 1994	9400.50	22 21	49.9	-6.30	-10.7	0.6730	-22.9635	2.11	9.94	0.040	-7.62
22 FEB 1994	9405.50	22 1	34.6	-8.8	-49.5	0.6359	-2.9687	2.62	10.52	0.015	5.12
27 FEB 1994	9410.50	21 44	22.6	-10.19	-39.3	0.6512	12.4527	1.71	10.27	0.100	13.65
4 MAR 1994	9415.50	21 37	32.9	-12.2	-22.8	0.7012	21.1330	1.11	9.54	0.227	20.56
9 MAR 1994	9420.50	21 41	29.7	-12.55	-0.9	0.7685	24.8478	0.77	8.70	0.349	24.86
14 MAR 1994	9425.50	21 53	43.1	-12.57	-23.3	0.8421	25.8173	0.58	7.94	0.452	27.05
19 MAR 1994	9430.50	22 11	41.2	-12.14	-43.2	0.9163	25.4681	0.45	7.30	0.537	27.69
24 MAR 1994	9435.50	22 33	34.7	-10.52	-6.8	0.9888	24.5331	0.33	6.76	0.609	27.18
29 MAR 1994	9440.50	22 58	15.1	-8.53	-37.7	1.0578	23.3245	0.21	6.32	0.672	25.79
3 APR 1994	9445.50	23 25	4.3	-6.22	-29.8	1.1231	21.8960	0.08	5.95	0.730	23.65
8 APR 1994	9450.50	23 53	46.1	-3.21	-31.6	1.1839	20.1216	-0.14	5.65	0.786	20.63
13 APR 1994	9455.50	0 24	21.2	0	6.30.7	1.2387	17.6896	-0.40	5.40	0.843	17.36
18 APR 1994	9460.50	0 57	4.4	3.58	13.6	1.2849	14.0353	-0.73	5.20	0.901	13.21
23 APR 1994	9465.50	1 32	19.6	8.8	19.6	1.3178	8.3238	-1.15	5.07	0.955	8.37
28 APR 1994	9470.50	2 10	28.7	12.27	19.1	1.3302	-0.2977	-1.63	5.03	0.994	2.89
3 MAY 1994	9475.50	2 51	25.7	16.38	36.3	1.3133	-11.7321	-1.75	5.09	0.993	-3.05
8 MAY 1994	9480.50	3 34	1.7	20.18	41.8	1.2619	-23.6440	-1.40	5.30	0.930	-8.97
13 MAY 1994	9485.50	4 16	2.1	23.5	32.3	1.1798	-32.4590	-0.92	5.67	0.813	-14.31
18 MAY 1994	9490.50	4 54	59.1	24.49	21.5	1.0791	-36.5445	-0.40	6.20	0.675	-18.56
23 MAY 1994	9495.50	5 29	2.2	25.33	52.2	0.9725	-30.7350	0.08	6.88	0.541	-21.49
28 MAY 1994	9500.50	5 56	59.9	25.29	47.6	0.8692	-34.4782	0.51	7.69	0.420	-22.96
2 JUN 1994	9505.50	6 18	0.3	24.49	27.4	0.7748	-30.7286	0.90	8.63	0.312	-22.89
7 JUN 1994	9510.50	6 31	18.2	23.44	38.5	0.6929	-25.8312	1.30	9.65	0.215	-21.13
12 JUN 1994	9515.50	6 36	20.3	22.26	21.4	0.6268	-19.7225	1.75	10.67	0.128	-17.59
17 JUN 1994	9520.50	6 33	14.7	21.5	23.1	0.5803	-12.1939	2.29	11.52	0.058	-12.34
22 JUN 1994	9525.50	6 23	42.0	19.53	13.1	0.5577	-3.2459	2.92	11.99	0.014	-6.24
27 JUN 1994	9530.50	6 11	25.8	19.2	13.0	0.5624	6.5910	3.04	11.89	0.009	5.00
2 JUL 1994	9535.50	6 1	20.0	18.42	43.0	0.5957	16.3848	2.38	11.22	0.047	10.68
7 JUL 1994	9540.50	5 57	33.4	18.57	59.3	0.5662	25.3233	1.73	10.19	0.122	15.88
12 JUL 1994	9545.50	6 2	22.7	19.41	51.3	0.7407	32.9502	1.15	9.03	0.226	19.23
17 JUL 1994	9550.50	6 16	31.7	20.40	25.3	0.8449	38.8664	0.58	7.91	0.356	20.51

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1994	9555.50	6 39 55.8	21 34 30.5	0.9628	0.3435	42.2105	0.02	6.95	0.510	19.76
27 JUL 1994	9560.50	7 11 53.9	22 1 11.0	1.0647	0.3202	41.4309	-0.56	6.16	0.678	17.13
1 AUG 1994	9565.50	7 50 41.0	21 37 28.8	1.1967	0.3082	35.1995	-1.07	5.59	0.837	12.97
6 AUG 1994	9570.50	8 33 6.9	20 9 38.4	1.2836	0.3114	24.5272	-1.44	5.21	0.948	7.86
11 AUG 1994	9575.50	9 15 33.0	17 41 19.7	1.3375	0.3288	12.8891	-1.62	5.00	0.994	2.79
16 AUG 1994	9580.50	9 55 30.7	14 29 20.5	1.3600	0.3549	3.1364	-1.39	4.92	0.992	-3.68
21 AUG 1994	9585.50	10 32 8.0	10 52 17.8	1.3581	0.3838	-4.0636	-0.98	4.92	0.984	-8.08
26 AUG 1994	9590.50	11 5 32.1	7 4 27.0	1.3384	0.4111	-9.2685	-0.63	5.00	0.927	-12.24
31 AUG 1994	9595.50	11 38 10.9	3 15 21.1	1.3058	0.4342	-13.1739	-0.36	5.12	0.886	-15.89
5 SEP 1994	9600.50	12 4 33.0	0-28-36.1	1.2630	0.4516	-16.3846	-0.15	5.29	0.843	-19.02
10 SEP 1994	9605.50	12 30 58.9	-4 -2-43.5	1.2115	0.4626	-19.2560	0.00	5.52	0.798	-21.65
15 SEP 1994	9610.50	12 55 38.1	-7-22-59.7	1.1520	0.4667	-21.9869	0.11	5.81	0.748	-23.76
20 SEP 1994	9615.50	13 18 24.9	-10-25-11.3	1.0846	0.4638	-24.6483	0.20	6.17	0.690	-25.28
25 SEP 1994	9620.50	13 38 52.3	-13 -3-59.9	1.0097	0.4541	-27.1595	0.28	6.62	0.620	-26.08
30 SEP 1994	9625.50	13 55 59.9	-15-11-39.4	0.9282	0.4378	-29.1700	0.38	7.20	0.531	-26.87
5 OCT 1994	9630.50	14 7 56.4	-18-35-36.4	0.8426	0.4156	-29.7988	0.54	7.94	0.416	-24.18
10 OCT 1994	9635.50	14 11 45.6	-16-55 -4.7	0.7592	0.3889	-27.1275	0.88	8.81	0.272	-20.27
15 OCT 1994	9640.50	14 4 14.0	-15-40-50.4	0.6923	0.3601	-17.8065	1.56	9.66	0.113	-13.23
20 OCT 1994	9645.50	13 45 51.7	-12-39-55.0	0.6658	0.3331	1.0125	2.79	10.04	0.007	-3.17
25 OCT 1994	9650.50	13 26 24.9	-8-59-27.2	0.7034	0.3137	24.9930	1.92	9.51	0.052	8.03
30 OCT 1994	9655.50	13 19 6.5	-6-47-12.8	0.8035	0.3076	42.3254	0.61	8.32	0.251	15.58
4 NOV 1994	9660.50	13 27 35.3	-6-53-57.9	0.9355	0.3171	47.1455	-0.15	7.15	0.493	18.64
9 NOV 1994	9665.50	13 47 17.4	-8-41-47.7	1.0672	0.3387	43.0905	-0.51	6.27	0.688	18.47
14 NOV 1994	9670.50	14 13 3.8	-11-18-31.0	1.1812	0.3666	35.6314	-0.64	5.66	0.818	16.62
19 NOV 1994	9675.50	14 41 51.9	-14 -9 -5.5	1.2727	0.3952	27.8492	-0.67	5.25	0.897	14.06
24 NOV 1994	9680.50	15 12 17.8	-16-54-13.9	1.3427	0.4211	20.7840	-0.67	4.98	0.945	11.25
29 NOV 1994	9685.50	15 43 48.6	-19-23-33.6	1.3936	0.4420	14.5568	-0.67	4.80	0.973	8.42
4 DEC 1994	9690.50	16 18 12.7	-21-31 -1.2	1.4274	0.4569	8.9940	-0.69	4.68	0.989	5.62
9 DEC 1994	9695.50	16 49 26.3	-23-12-30.7	1.4459	0.4651	3.8676	-0.75	4.62	0.997	2.95
14 DEC 1994	9700.50	17 23 26.3	-24-24-46.8	1.4500	0.4664	-1.0585	-0.80	4.61	0.999	1.24
19 DEC 1994	9705.50	17 58 7.0	-25 -4-56.9	1.4398	0.4607	-6.0280	-0.77	4.64	0.996	-3.19
24 DEC 1994	9710.50	18 33 17.7	-25-10-23.0	1.4149	0.4482	-11.2923	-0.74	4.73	0.987	-5.93
29 DEC 1994	9715.50	19 8 40.2	-24-38-47.7	1.3740	0.4294	-17.1201	-0.73	4.87	0.988	-8.80

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1995	9720.50	19 43 44.7	-23-28-42.4	1.3152	0.4052	-23.7589	-0.74	5.08	0.935		-11.73
8 JAN 1995	9725.50	20 17 40.2	-21-40-30.2	1.2359	0.3773	-31.3038	-0.74	5.41	0.877		-14.61
13 JAN 1995	9730.50	20 48 56.4	-19-18-50.0	1.1339	0.3486	-39.3168	-0.68	5.90	0.778		-17.13
18 JAN 1995	9735.50	21 14 46.7	-16-37-33.8	1.0101	0.3239	-45.9309	-0.46	6.62	0.620		-18.64
23 JAN 1995	9740.50	21 30 30.4	-14 -7 -0.3	0.8740	0.3093	-46.8925	0.06	7.65	0.399		-17.93
28 JAN 1995	9745.50	21 30 29.1	-12-34-29.4	0.7748	0.3098	-37.1446	1.01	8.92	0.164		-13.47
2 FEB 1995	9750.50	21 13 35.8	-12-37-13.1	0.6699	0.3247	-16.9550	2.38	9.98	0.021		-5.41
7 FEB 1995	9755.50	20 49 46.1	-13-56-30.1	0.6533	0.3497	4.7907	2.21	10.24	0.037		7.65
12 FEB 1995	9760.50	20 33 14.5	-15-32-18.6	0.6904	0.3784	19.3825	1.29	9.69	0.161		16.36
17 FEB 1995	9765.50	20 29 51.4	-16-43-55.2	0.7575	0.4062	26.0316	0.78	8.83	0.307		22.29
22 FEB 1995	9770.50	20 37 51.8	-17-19 -4.9	0.8360	0.4302	27.7742	0.52	8.00	0.434		25.55
27 FEB 1995	9775.50	20 53 47.8	-17-16-37.2	0.9157	0.4488	27.1399	0.38	7.30	0.536		26.87
4 MAR 1995	9780.50	21 14 53.7	-16-37-47.5	0.9918	0.4610	25.5123	0.29	6.74	0.617		26.88
9 MAR 1995	9785.50	21 39 21.3	-15-24 -7.9	1.0627	0.4664	23.5323	0.20	6.29	0.682		25.94
14 MAR 1995	9790.50	22 6 4.8	-13-37 -5.4	1.1276	0.4649	21.4359	0.10	5.93	0.738		24.28
19 MAR 1995	9795.50	22 34 27.5	-11-18 0.0	1.1864	0.4564	19.2377	-0.03	5.64	0.789		21.99
24 MAR 1995	9800.50	23 4 12.8	-8-28 -8.3	1.2385	0.4413	16.7917	-0.21	5.40	0.836		19.13
29 MAR 1995	9805.50	23 35 18.4	-5 -8-55.8	1.2829	0.4202	13.8006	-0.45	5.21	0.883		15.70
3 APR 1995	9810.50	0 7 53.9	-1-22-17.7	1.3172	0.3942	9.7825	-0.77	5.08	0.929		11.69
8 APR 1995	9815.50	0 42 16.9	2 48 30.8	1.3377	0.3655	4.0263	-1.16	5.00	0.971		7.07
13 APR 1995	9820.50	1 18 44.7	7 17 4.2	1.3380	0.3378	-4.2527	-1.62	5.00	0.997		1.94
18 APR 1995	9825.50	1 57 15.7	11 50 49.5	1.3105	0.3164	-15.1914	-1.67	5.10	0.988		-3.92
23 APR 1995	9830.50	2 36 58.8	16 8 59.7	1.2494	0.3075	-27.0050	-1.37	5.35	0.920		-9.58
28 APR 1995	9835.50	3 15 56.7	19 46 52.2	1.1572	0.3142	-36.1257	-0.91	5.78	0.792		-14.68
3 MAY 1995	9840.50	3 51 41.9	22 27 2.9	1.0457	0.3340	-40.2026	-0.37	6.39	0.635		-18.60
8 MAY 1995	9845.50	4 22 8.8	24 5 33.7	0.9294	0.3612	-39.6914	0.16	7.19	0.482		-20.96
13 MAY 1995	9850.50	4 45 47.5	24 47 41.1	0.8194	0.3900	-38.1413	0.67	8.16	0.346		-21.54
18 MAY 1995	9855.50	5 1 32.2	24 41 34.7	0.7225	0.4165	-30.6717	1.17	9.26	0.228		-20.22
23 MAY 1995	9860.50	5 8 41.1	23 55 12.7	0.6436	0.4385	-23.7543	1.70	10.39	0.129		-16.90
28 MAY 1995	9865.50	5 7 23.7	22 36 56.0	0.5866	0.4546	-15.5221	2.31	11.40	0.054		-11.66
2 JUN 1995	9870.50	4 59 25.9	20 59 6.2	0.5550	0.4641	-6.2089	3.02	12.05	0.010		-5.15
7 JUN 1995	9875.50	4 48 29.9	19 21 38.4	0.5512	0.4667	3.5375	3.15	12.13	0.006		4.04
12 JUN 1995	9880.50	4 39 13.6	18 8 39.3	0.5750	0.4623	12.8083	2.46	11.63	0.042		10.55
17 JUN 1995	9885.50	4 35 21.3	17 37 45.3	0.6240	0.4511	20.9292	1.85	10.72	0.110		16.13
22 JUN 1995	9890.50	4 38 47.3	17 52 53.8	0.6946	0.4334	27.7045	1.35	9.63	0.199		19.90
27 JUN 1995	9895.50	4 50 1.2	18 46 28.1	0.7828	0.4101	33.1910	0.89	8.54	0.303		21.77
2 JUL 1995	9900.50	5 8 58.7	20 4 27.5	0.8849	0.3827	37.2807	0.44	7.56	0.423		21.83
7 JUL 1995	9905.50	5 35 31.7	21 29 13.1	0.9962	0.3539	39.3443	-0.05	6.71	0.559		20.22
12 JUL 1995	9910.50	6 9 26.9	22 39 37.1	1.1090	0.3280	38.0665	-0.58	6.03	0.709		17.04
17 JUL 1995	9915.50	6 49 50.6	23 11 42.1	1.2114	0.3110	32.0085	-1.09	5.52	0.852		12.54

GEOCENTRIC EPHEMERIS FOR MERCURY

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	7 34	24.2	22 44	40.1	1.2894	0.3084	21.4857	5.19	0.956	7.15
27 JUL 1995	9925.50	8 19	39.9	21 11	34.8	1.3340	0.3209	9.4758	5.01	0.997	2.02
1 AUG 1995	9930.50	9 2	37.2	18 42	29.2	1.3459	0.3445	-0.7238	4.97	0.985	-4.71
6 AUG 1995	9935.50	9 41	49.7	15 35	21.4	1.3326	0.3729	-8.0612	5.02	0.946	-9.59
11 AUG 1995	9940.50	10 17	7.5	12 6	47.0	1.3017	0.4012	-13.0332	5.14	0.896	-13.96
16 AUG 1995	9945.50	10 48	54.1	8 29	1.2	1.2588	0.4261	-16.4866	5.31	0.845	-17.73
21 AUG 1995	9950.50	11 17	39.0	4 50	38.8	1.2072	0.4458	-19.0910	5.54	0.794	-20.89
26 AUG 1995	9955.50	11 43	44.4	1 18	2.5	1.1489	0.4592	-21.2690	5.82	0.741	-23.45
31 AUG 1995	9960.50	12 7	20.0	-2 -3-21.8	1.0846	0.4660	0.23	-23.2400	6.17	0.685	-26.39
5 SEP 1995	9965.50	12 28	19.0	-5 -7-59.9	1.0148	0.4657	0.34	-25.0430	6.59	0.622	-26.61
10 SEP 1995	9970.50	12 46	11.2	-7-48-55.3	0.9403	0.4585	0.44	-26.5316	7.11	0.546	-26.96
15 SEP 1995	9975.50	12 59	54.1	-9-56-10.3	0.8623	0.4447	0.57	-27.2749	7.75	0.454	-26.12
20 SEP 1995	9980.50	13 7	41.9	-11-14-10.8	0.7844	0.4246	0.79	-26.3042	8.53	0.340	-23.60
25 SEP 1995	9985.50	13 7	9.2	-11-19-12.8	0.7138	0.3994	1.19	-21.7459	9.37	0.204	-18.73
30 SEP 1995	9990.50	12 58	30.3	-9-44-22.6	0.6649	0.3709	1.94	-10.8299	10.06	0.071	-10.94
5 OCT 1995	9995.50	12 38	26.4	-6-32-25.5	0.6589	0.3427	3.00	7.8361	10.15	0.003	2.21
10 OCT 1995	10000.50	12 22	51.5	-3 -3-31.4	0.7132	0.3197	1.71	29.4720	9.38	0.078	9.77
15 OCT 1995	10005.50	12 20	7.4	-1 -9-57.1	0.8227	0.3080	0.50	44.6268	8.13	0.280	16.11
20 OCT 1995	10010.50	12 32	9.6	-1-30-57.2	0.9598	0.3118	0.25	48.4443	6.97	0.522	18.22
25 OCT 1995	10015.50	12 54	24.6	-3-33-48.3	1.0941	0.3295	-0.64	43.6018	6.11	0.719	17.32
30 OCT 1995	10020.50	13 21	53.8	-6-30-20.2	1.2083	0.3558	0.79	35.2677	5.53	0.849	14.86
4 NOV 1995	10025.50	13 51	38.6	-9-45-27.8	1.2977	0.3846	-0.83	26.7453	5.15	0.925	11.80
9 NOV 1995	10030.50	14 22	21.5	-12-58-59.8	1.3637	0.4118	-0.83	19.1758	4.90	0.967	8.60
14 NOV 1995	10035.50	14 53	37.2	-16 0 -3.5	1.4095	0.4348	-0.82	12.6481	4.74	0.988	5.46
19 NOV 1995	10040.50	15 25	23.0	-18-42-27.0	1.4376	0.4520	-0.84	6.9251	4.65	0.998	2.44
24 NOV 1995	10045.50	15 57	42.8	-21 -2 -6.4	1.4499	0.4628	-0.84	1.7189	4.61	1.000	-0.71
29 NOV 1995	10050.50	16 30	40.8	-22-55-49.6	1.4477	0.4667	-0.72	-3.2352	4.62	0.996	-3.41
4 DEC 1995	10055.50	17 4	17.8	-24-20-41.2	1.4313	0.4636	-0.64	-8.1678	4.67	0.987	-6.17
9 DEC 1995	10060.50	17 38	28.1	-25-13-51.3	1.4003	0.4537	-0.59	-13.3183	4.78	0.971	-8.91
14 DEC 1995	10065.50	18 12	56.5	-25-32-38.1	1.3539	0.4372	-0.58	-18.9169	4.94	0.946	-11.61
19 DEC 1995	10070.50	18 47	12.9	-25-14-48.3	1.2905	0.4149	-0.58	-25.1611	5.18	0.906	-14.25
24 DEC 1995	10075.50	19 20	22.0	-24-19-31.5	1.2079	0.3881	-0.58	-32.0954	5.54	0.843	-16.70
29 DEC 1995	10080.50	19 50	42.9	-22-49-18.4	1.1048	0.3592	-0.52	-39.2660	6.05	0.741	-18.66

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1986	6435.50	18 47	18.9	-23-29	-1.6	1.7063	0.7274	-3.47	9.81	0.998	3.54
10 JAN 1986	6440.50	19 14	38.4	-23 0-25.6	1.7091	0.7277	0.8131	-3.48	9.79	0.999	2.40
15 JAN 1986	6445.50	19 41	42.1	-22-14 -9.0	1.7110	0.7280	0.4638	-3.50	9.78	1.000	1.40
20 JAN 1986	6450.50	20 8	23.7	-21-11 -0.5	1.7118	0.7282	0.1236	-3.50	9.78	1.000	-0.99
25 JAN 1986	6455.50	20 34	38.6	-19-52 -5.4	1.7117	0.7283	-0.2098	-3.49	9.78	1.000	-1.70
30 JAN 1986	6460.50	21 0	23.7	-18-18-40.5	1.7106	0.7283	-0.5426	-3.47	9.79	0.999	-2.77
4 FEB 1986	6465.50	21 25	38.0	-16-32-10.8	1.7085	0.7282	-0.8878	-3.46	9.80	0.998	-3.91
9 FEB 1986	6470.50	21 50	21.6	-14-34 -8.4	1.7054	0.7280	-1.2492	-3.44	9.81	0.996	-5.08
14 FEB 1986	6475.50	22 14	36.8	-12-28-10.0	1.7013	0.7277	-1.6184	-3.42	9.84	0.994	-6.28
19 FEB 1986	6480.50	22 38	23.1	-10 -9-53.1	1.6961	0.7273	-1.9826	-3.41	9.87	0.992	-7.45
24 FEB 1986	6485.50	23 1	47.2	-7-46-55.2	1.6899	0.7269	-2.3470	-3.40	9.91	0.989	-8.64
1 MAR 1986	6490.50	23 24	52.4	-5-18-50.9	1.6826	0.7264	-2.7159	-3.39	9.95	0.986	-9.84
6 MAR 1986	6495.50	23 47	43.8	-2-47-12.9	1.6742	0.7258	-3.1034	-3.37	10.00	0.983	-11.04
11 MAR 1986	6500.50	0 10	26.6	0-13-34.6	1.6646	0.7252	-3.5110	-3.37	10.06	0.978	-12.25
16 MAR 1986	6505.50	0 33	5.8	2 20 30.5	1.6539	0.7245	-3.9280	-3.36	10.12	0.974	-13.46
21 MAR 1986	6510.50	0 55	46.7	4 53 29.5	1.6419	0.7238	-4.3476	-3.35	10.19	0.969	-14.68
26 MAR 1986	6515.50	1 18	34.2	7 23 50.0	1.6288	0.7232	-4.7654	-3.35	10.28	0.963	-15.91
31 MAR 1986	6520.50	1 41	33.8	9 50 1.2	1.6144	0.7225	-5.1878	-3.34	10.37	0.957	-17.13
5 APR 1986	6525.50	2 4	49.8	12 10 31.7	1.5988	0.7218	-5.6270	-3.34	10.47	0.950	-18.36
10 APR 1986	6530.50	2 28	26.5	14 23 47.7	1.5819	0.7212	-6.0821	-3.34	10.58	0.942	-19.60
15 APR 1986	6535.50	2 52	27.1	16 28 14.7	1.5637	0.7206	-6.5431	-3.34	10.70	0.934	-20.83
20 APR 1986	6540.50	3 16	53.2	18 22 18.9	1.5441	0.7200	-7.0008	-3.34	10.84	0.926	-22.07
25 APR 1986	6545.50	3 41	45.9	20 4 29.0	1.5232	0.7195	-7.4476	-3.34	10.99	0.917	-23.31
30 APR 1986	6550.50	4 7	4.9	21 33 19.8	1.5011	0.7191	-7.8901	-3.34	11.15	0.907	-24.55
5 MAY 1986	6555.50	4 32	48.2	22 47 32.7	1.4777	0.7188	-8.3389	-3.35	11.33	0.898	-25.78
10 MAY 1986	6560.50	4 58	52.3	23 45 57.0	1.4529	0.7186	-8.7911	-3.36	11.52	0.885	-27.01
15 MAY 1986	6565.50	5 25	11.8	24 27 36.1	1.4269	0.7184	-9.2383	-3.36	11.73	0.873	-28.23
20 MAY 1986	6570.50	5 51	39.5	24 51 49.1	1.3996	0.7184	-9.6866	-3.37	11.96	0.861	-29.44
25 MAY 1986	6575.50	6 18	8.0	24 58 13.4	1.3711	0.7184	-10.0739	-3.38	12.21	0.848	-30.64
30 MAY 1986	6580.50	6 44	29.3	24 46 47.5	1.3414	0.7186	-10.4623	-3.40	12.48	0.834	-31.83
4 JUN 1986	6585.50	7 10	35.9	24 17 47.6	1.3107	0.7188	-10.8424	-3.41	12.77	0.820	-33.00
9 JUN 1986	6590.50	7 36	20.6	23 31 48.9	1.2788	0.7192	-11.2130	-3.43	13.09	0.805	-34.15
14 JUN 1986	6595.50	8 1	37.0	22 29 44.6	1.2459	0.7196	-11.5677	-3.45	13.43	0.790	-35.28
19 JUN 1986	6600.50	8 26	19.8	21 12 41.0	1.2120	0.7201	-11.8932	-3.47	13.81	0.774	-36.38
24 JUN 1986	6605.50	8 50	25.7	19 41 55.1	1.1773	0.7206	-12.1835	-3.49	14.22	0.757	-37.46
29 JUN 1986	6610.50	9 13	52.9	17 58 49.8	1.1417	0.7212	-12.4482	-3.51	14.66	0.740	-38.50
4 JUL 1986	6615.50	9 36	41.3	16 4 50.1	1.1054	0.7219	-12.6957	-3.54	15.14	0.722	-39.50
9 JUL 1986	6620.50	9 58	51.8	14 1 24.6	1.0684	0.7226	-12.9279	-3.57	15.67	0.704	-40.46
14 JUL 1986	6625.50	10 20	24.9	11 50 3.7	1.0307	0.7232	-13.1395	-3.60	16.24	0.685	-41.37
19 JUL 1986	6630.50	10 41	22.8	9 32 16.6	0.9925	0.7239	-13.3168	-3.63	16.86	0.666	-42.23

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6635.50	11 1	47.7	7 9 30.3	0.9539	0.7248	-13.4565	-3.67	17.55	0.648	-43.03
29 JUL 1986	6640.50	11 21	42.2	4 43 6.9	0.9148	0.7253	-13.5681	-3.71	18.30	0.625	-43.76
3 AUG 1986	6645.50	11 41	9.2	2 14 24.2	0.8755	0.7259	-13.6801	-3.75	19.12	0.604	-44.41
8 AUG 1986	6650.50	12 0	10.9	0 15-19.0	0.8359	0.7264	-13.7361	-3.80	20.02	0.582	-44.97
13 AUG 1986	6655.50	12 18	48.5	-2-44-43.7	0.7962	0.7269	-13.7888	-3.84	21.02	0.559	-45.44
18 AUG 1986	6660.50	12 37	2.2	-5-12-31.1	0.7564	0.7274	-13.8027	-3.89	22.13	0.535	-45.80
23 AUG 1986	6665.50	12 54	51.4	-7-37-23.8	0.7165	0.7277	-13.7743	-3.94	23.36	0.510	-46.01
28 AUG 1986	6670.50	13 12	14.8	-9-58 -9.4	0.6768	0.7280	-13.7098	-3.99	24.73	0.484	-46.08
2 SEP 1986	6675.50	13 29	9.4	-12-13-36.6	0.6374	0.7282	-13.6132	-4.05	26.26	0.456	-45.98
7 SEP 1986	6680.50	13 45	29.7	-14-22-30.2	0.5982	0.7283	-13.4836	-4.10	27.98	0.427	-45.63
12 SEP 1986	6685.50	14 1	6.5	-16-23-31.3	0.5595	0.7282	-13.3024	-4.15	29.91	0.396	-45.05
17 SEP 1986	6690.50	14 15	47.1	-18-15-15.3	0.5215	0.7281	-13.0435	-4.20	32.10	0.363	-44.16
22 SEP 1986	6695.50	14 29	14.8	-19-58-13.0	0.4843	0.7279	-12.6904	-4.24	34.56	0.328	-42.90
27 SEP 1986	6700.50	14 41	9.2	-21-24-50.1	0.4483	0.7277	-12.2288	-4.27	37.34	0.290	-41.20
2 OCT 1986	6705.50	14 51	4.9	-22-39-13.3	0.4138	0.7273	-11.6380	-4.28	40.45	0.249	-38.95
7 OCT 1986	6710.50	14 58	31.0	-23-38-55.8	0.3812	0.7268	-10.8799	-4.27	43.91	0.206	-36.06
12 OCT 1986	6715.50	15 2	52.7	-24-14-42.1	0.3512	0.7263	-9.8890	-4.22	47.66	0.162	-32.39
17 OCT 1986	6720.50	15 3	37.9	-24-28-18.5	0.3244	0.7258	-8.5945	-4.12	51.59	0.116	-27.84
22 OCT 1986	6725.50	15 0	29.3	-24-13 -1.8	0.3019	0.7251	-6.9495	-3.94	55.45	0.073	-22.33
27 OCT 1986	6730.50	14 53	39.7	-23-25 -3.2	0.2846	0.7245	-4.9437	-3.67	58.81	0.037	-15.96
1 NOV 1986	6735.50	14 44	2.7	-22 -4 -0.2	0.2736	0.7238	-2.6274	-3.31	61.17	0.012	-9.19
6 NOV 1986	6740.50	14 33	12.1	-20-15-49.8	0.2696	0.7231	-0.1196	-3.06	62.08	0.004	5.04
11 NOV 1986	6745.50	14 23	1.0	-18-13-28.3	0.2730	0.7224	2.4075	-3.35	61.32	0.013	9.65
16 NOV 1986	6750.50	14 15	11.6	-16-13-39.0	0.2834	0.7218	4.7575	-3.72	59.07	0.039	16.52
21 NOV 1986	6755.50	14 10	49.9	-14-31-16.6	0.3001	0.7211	6.7799	-4.00	55.77	0.077	22.97
26 NOV 1986	6760.50	14 10	19.1	-13-15-21.4	0.3222	0.7206	8.4194	-4.19	51.96	0.122	28.53
1 DEC 1986	6765.50	14 13	30.3	-12-28-34.7	0.3484	0.7200	9.6988	-4.30	48.04	0.168	33.13
6 DEC 1986	6770.50	14 18	58.7	-12 -9-17.7	0.3779	0.7195	10.6845	-4.35	44.29	0.215	36.84
11 DEC 1986	6775.50	14 29	15.9	-12-13-46.3	0.4099	0.7191	11.4441	-4.37	40.84	0.259	39.77
16 DEC 1986	6780.50	14 40	56.7	-12-37-37.2	0.4438	0.7188	12.0190	-4.36	37.72	0.300	42.04
21 DEC 1986	6785.50	14 54	39.6	-13-18-24.4	0.4792	0.7186	12.4385	-4.33	34.93	0.339	43.75
26 DEC 1986	6790.50	15 10	6.7	-14 -5-54.5	0.5155	0.7185	12.7327	-4.29	32.47	0.375	45.02
31 DEC 1986	6795.50	15 27	3.2	-15 -2-14.1	0.5526	0.7184	12.9326	-4.24	30.29	0.408	45.91

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	15 45	16.7	-16	-1-55.0	0.5902	13.0699	-4.19	28.36	0.440	46.50
10 JAN 1987	6805.50	16 4	38.4	-17	-1-54.0	0.6281	13.1629	-4.14	26.85	0.489	46.83
15 JAN 1987	6810.50	16 25	1.2	-17	-59-29.4	0.6861	13.2113	-4.09	25.13	0.498	46.96
20 JAN 1987	6815.50	16 46	19.2	-18	-52-14.1	0.7043	13.2137	-4.04	23.77	0.522	46.91
25 JAN 1987	6820.50	17 8	26.1	-19	-37-55.5	0.7424	13.1746	-3.98	22.55	0.547	46.77
30 JAN 1987	6825.50	17 31	15.2	-20	-14-37.5	0.7804	13.1059	-3.93	21.45	0.570	46.37
4 FEB 1987	6830.50	17 54	39.3	-20	-40-42.1	0.8181	13.0248	-3.89	20.48	0.592	45.94
9 FEB 1987	6835.50	18 18	31.5	-20	-54-50.2	0.8558	12.9380	-3.84	19.58	0.613	45.41
14 FEB 1987	6840.50	18 42	45.1	-20	-56 -2.0	0.8928	12.8312	-3.79	18.75	0.633	44.81
19 FEB 1987	6845.50	19 7	13.3	-20	-43-34.7	0.9297	12.7046	-3.75	18.00	0.652	44.13
24 FEB 1987	6850.50	19 31	49.2	-20	-17 -5.2	0.9662	12.5547	-3.71	17.33	0.671	43.39
1 MAR 1987	6855.50	19 56	25.5	-19	-30-32.3	1.0022	12.3904	-3.67	16.70	0.688	42.60
6 MAR 1987	6860.50	20 20	58.0	-18	-42-12.3	1.0377	12.2258	-3.63	16.13	0.705	41.78
11 MAR 1987	6865.50	20 45	15.9	-17	-34-37.8	1.0728	12.0609	-3.59	15.80	0.722	40.87
16 MAR 1987	6870.50	21 9	21.6	-16	-14-34.1	1.1074	11.8866	-3.56	15.12	0.738	39.95
21 MAR 1987	6875.50	21 33	11.2	-14	-42-55.6	1.1414	11.6949	-3.53	14.65	0.753	38.99
26 MAR 1987	6880.50	21 56	43.4	-13	0-47.7	1.1749	11.4818	-3.50	14.25	0.768	38.00
31 MAR 1987	6885.50	22 19	57.9	-11	-9-24.3	1.2077	11.2563	-3.47	13.88	0.782	36.98
5 APR 1987	6890.50	22 42	55.4	-9	-10 -3.0	1.2399	11.0302	-3.45	13.50	0.795	36.94
10 APR 1987	6895.50	23 5	37.9	-7	-4 -3.7	1.2714	10.8015	-3.42	13.17	0.809	34.86
15 APR 1987	6900.50	23 28	8.4	-4	-52-46.0	1.3023	10.5623	-3.40	12.85	0.822	33.76
20 APR 1987	6905.50	23 50	30.5	-2	-37-29.1	1.3324	10.3027	-3.38	12.56	0.834	32.64
25 APR 1987	6910.50	0 12	48.1	0	-19-35.8	1.3617	10.0178	-3.37	12.29	0.846	31.50
30 APR 1987	6915.50	0 35	5.0	1	59 29.5	1.3902	9.7180	-3.35	12.04	0.858	30.33
5 MAY 1987	6920.50	0 57	25.5	4	18 22.5	1.4179	9.4132	-3.34	11.81	0.869	29.15
10 MAY 1987	6925.50	1 19	53.8	6	35 38.7	1.4446	9.1019	-3.33	11.59	0.880	27.95
15 MAY 1987	6930.50	1 42	34.4	8	49 54.8	1.4704	8.7781	-3.32	11.38	0.890	26.72
20 MAY 1987	6935.50	2 5	31.7	10	59 46.7	1.4953	8.4305	-3.31	11.19	0.900	25.49
25 MAY 1987	6940.50	2 28	49.5	13	3 46.2	1.5191	8.0552	-3.31	11.02	0.910	24.23
30 MAY 1987	6945.50	2 52	30.9	15	0 24.4	1.5418	7.6641	-3.30	10.86	0.919	22.96
4 JUN 1987	6950.50	3 16	37.8	16	48 12.0	1.5633	7.2659	-3.30	10.71	0.928	21.68
9 JUN 1987	6955.50	3 41	11.7	18	25 41.0	1.5837	6.8618	-3.30	10.57	0.936	20.39
14 JUN 1987	6960.50	4 6	13.3	19	51 27.6	1.6030	6.4475	-3.31	10.44	0.944	19.08
19 JUN 1987	6965.50	4 31	41.7	21	4 11.8	1.6210	6.0105	-3.31	10.33	0.952	17.76
24 JUN 1987	6970.50	4 57	34.7	22	2 38.7	1.6377	5.5499	-3.32	10.22	0.959	16.43
29 JUN 1987	6975.50	5 23	48.2	22	45 44.4	1.6530	5.0778	-3.33	10.13	0.965	15.10
4 JUL 1987	6980.50	5 50	16.9	23	12 37.1	1.6670	4.6025	-3.34	10.04	0.971	13.75
9 JUL 1987	6985.50	6 16	54.7	23	22 41.0	1.6796	4.1291	-3.35	9.97	0.976	12.40
14 JUL 1987	6990.50	6 43	35.2	23	15 38.3	1.6908	3.6532	-3.36	9.90	0.981	11.05
19 JUL 1987	6995.50	7 10	11.6	22	51 27.8	1.7007	3.1625	-3.38	9.84	0.986	9.70

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1987	7000.50	7 36	37.6	22 10	26.7	1.7091	0.7191	-3.40	9.79	0.989	8.34
29 JUL 1987	7005.50	8 2	47.1	21 13	10.9	1.7160	0.7188	-3.41	9.75	0.993	6.99
3 AUG 1987	7010.50	8 28	35.2	20 0	31.3	1.7215	0.7186	-3.43	9.72	0.995	5.65
8 AUG 1987	7015.50	8 53	58.7	18 33	31.7	1.7258	0.7185	-3.45	9.70	0.997	4.33
13 AUG 1987	7020.50	9 18	55.8	16 53	25.5	1.7282	0.7185	-3.47	9.69	0.999	3.08
18 AUG 1987	7025.50	9 43	26.4	15 1	31.9	1.7295	0.7185	-3.49	9.68	0.999	1.93
23 AUG 1987	7030.50	10 7	31.5	12 59	16.3	1.7294	0.7187	-3.50	9.68	1.000	-1.35
28 AUG 1987	7035.50	10 31	12.9	10 48	8.5	1.7279	0.7189	-3.49	9.69	0.999	-1.90
2 SEP 1987	7040.50	10 54	33.5	8 29	39.8	1.7250	0.7193	-3.48	9.70	0.999	-3.02
7 SEP 1987	7045.50	11 17	37.1	6 5	21.6	1.7209	0.7197	-3.46	9.73	0.997	-4.28
12 SEP 1987	7050.50	11 40	28.1	3 36	44.5	1.7154	0.7202	-3.44	9.76	0.995	-5.55
17 SEP 1987	7055.50	12 3	11.7	1 5	17.4	1.7088	0.7207	-3.42	9.80	0.993	-6.85
22 SEP 1987	7060.50	12 25	53.2	-1 27	-28.4	1.7009	0.7213	-3.40	9.84	0.990	-8.15
27 SEP 1987	7065.50	12 48	37.5	-4 0	-0.1	1.6919	0.7220	-3.39	9.89	0.987	-9.45
2 OCT 1987	7070.50	13 11	29.9	-6 30	-44.1	1.6817	0.7227	-3.38	9.95	0.983	-10.74
7 OCT 1987	7075.50	13 34	35.2	-8 58	-5.4	1.6704	0.7233	-3.37	10.02	0.979	-12.02
12 OCT 1987	7080.50	13 57	58.7	-11 20	-29.4	1.6580	0.7240	-3.36	10.10	0.974	-13.30
17 OCT 1987	7085.50	14 21	44.9	-13 36	-20.3	1.6447	0.7247	-3.35	10.18	0.969	-14.58
22 OCT 1987	7090.50	14 45	57.5	-15 43	-58.9	1.6304	0.7253	-3.34	10.27	0.964	-15.81
27 OCT 1987	7095.50	15 10	39.3	-17 41	-44.8	1.6151	0.7259	-3.34	10.36	0.958	-17.08
1 NOV 1987	7100.50	15 35	51.6	-19 27	-58.5	1.5988	0.7265	-3.33	10.47	0.952	-18.29
6 NOV 1987	7105.50	16 1	34.4	-21 1	-2.9	1.5816	0.7270	-3.33	10.58	0.945	-19.51
11 NOV 1987	7110.50	16 27	46.4	-22 19	-28.9	1.5636	0.7274	-3.33	10.70	0.938	-20.72
16 NOV 1987	7115.50	16 54	24.7	-23 21	-55.1	1.5448	0.7277	-3.33	10.84	0.931	-21.91
21 NOV 1987	7120.50	17 21	24.2	-24 7	-11.6	1.5251	0.7280	-3.33	10.98	0.923	-23.09
26 NOV 1987	7125.50	17 48	38.4	-24 34	-25.3	1.5046	0.7281	-3.34	11.13	0.915	-24.26
1 DEC 1987	7130.50	18 15	59.1	-24 43	-1.8	1.4832	0.7282	-3.34	11.29	0.907	-25.42
6 DEC 1987	7135.50	18 43	17.8	-24 32	-48.6	1.4611	0.7282	-3.35	11.46	0.898	-26.56
11 DEC 1987	7140.50	19 10	26.2	-24 3	-58.1	1.4382	0.7281	-3.36	11.64	0.889	-27.69
16 DEC 1987	7145.50	19 37	16.6	-23 16	-54.5	1.4145	0.7279	-3.37	11.83	0.879	-28.81
21 DEC 1987	7150.50	20 3	42.7	-22 12	-33.8	1.3901	0.7276	-3.38	12.04	0.869	-29.91
26 DEC 1987	7155.50	20 29	38.7	-20 52	-1.8	1.3649	0.7272	-3.40	12.26	0.859	-31.00
31 DEC 1987	7160.50	20 55	0.9	-19 16	-39.4	1.3389	0.7267	-3.41	12.50	0.848	-32.07

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (^m)	PHASE	ELONG
5 JAN 1988	7165.50	21 19 47.3	-17-27-56.8	1.3121	0.7262	-9.3982	-3.43	12.76	0.836		-33.12
10 JAN 1988	7170.50	21 43 57.7	-15-27-29.0	1.2846	0.7256	-9.6530	-3.45	13.03	0.824		-34.16
15 JAN 1988	7175.50	22 7 33.5	-13-16-52.5	1.2564	0.7250	-9.9131	-3.47	13.32	0.812		-35.17
20 JAN 1988	7180.50	22 30 37.3	-10-57-45.5	1.2273	0.7244	-10.1862	-3.49	13.64	0.799		-36.17
25 JAN 1988	7185.50	22 53 11.7	-8-31-47.9	1.1975	0.7237	-10.4640	-3.51	13.98	0.785		-37.15
30 JAN 1988	7190.50	23 15 20.3	-6 0-38.1	1.1669	0.7230	-10.7340	-3.53	14.34	0.771		-38.10
4 FEB 1988	7195.50	23 37 6.8	-3-25-52.3	1.1355	0.7223	-10.9937	-3.58	14.74	0.756		-39.02
9 FEB 1988	7200.50	23 58 35.6	0-49 -2.3	1.1034	0.7217	-11.2463	-3.59	15.17	0.740		-39.91
14 FEB 1988	7205.50	0 19 51.3	1 48 24.1	1.0706	0.7211	-11.5017	-3.62	15.64	0.724		-40.77
19 FEB 1988	7210.50	0 40 58.0	4 24 58.8	1.0370	0.7205	-11.7657	-3.65	16.14	0.707		-41.59
24 FEB 1988	7215.50	1 1 59.1	6 59 13.6	1.0026	0.7200	-12.0273	-3.68	16.69	0.689		-42.37
29 FEB 1988	7220.50	1 22 57.4	9 29 40.9	0.9675	0.7195	-12.2742	-3.71	17.30	0.670		-43.10
5 MAR 1988	7225.50	1 43 55.0	11 54 56.0	0.9318	0.7191	-12.5007	-3.75	17.98	0.650		-43.77
10 MAR 1988	7230.50	2 4 53.6	14 13 38.9	0.8954	0.7188	-12.7081	-3.79	18.69	0.629		-44.37
15 MAR 1988	7235.50	2 25 54.1	16 24 33.6	0.8584	0.7186	-12.9060	-3.82	19.50	0.607		-44.89
20 MAR 1988	7240.50	2 46 55.5	18 26 26.4	0.8208	0.7185	-13.0960	-3.86	20.39	0.584		-45.33
25 MAR 1988	7245.50	3 7 54.9	20 18 7.1	0.7828	0.7185	-13.2645	-3.91	21.38	0.560		-45.66
30 MAR 1988	7250.50	3 28 46.9	21 58 32.2	0.7443	0.7185	-13.3968	-3.95	22.49	0.534		-45.87
4 APR 1988	7255.50	3 49 24.1	23 26 49.1	0.7054	0.7187	-13.4816	-3.99	23.73	0.507		-45.93
9 APR 1988	7260.50	4 9 37.3	24 42 19.6	0.6664	0.7190	-13.5169	-4.04	25.12	0.478		-45.82
14 APR 1988	7265.50	4 29 14.7	25 44 40.6	0.6274	0.7193	-13.5071	-4.08	26.68	0.447		-45.49
19 APR 1988	7270.50	4 48 1.3	26 33 43.1	0.5885	0.7197	-13.4435	-4.12	28.44	0.415		-44.91
24 APR 1988	7275.50	5 5 37.8	27 9 34.3	0.5498	0.7202	-13.3006	-4.16	30.44	0.380		-44.03
29 APR 1988	7280.50	5 21 41.1	27 32 35.9	0.5118	0.7208	-13.0483	-4.19	32.71	0.342		-42.78
4 MAY 1988	7285.50	5 35 44.9	27 43 22.5	0.4746	0.7214	-12.6548	-4.21	35.27	0.302		-41.07
9 MAY 1988	7290.50	5 47 20.1	27 42 35.4	0.4388	0.7220	-12.0933	-4.21	38.14	0.259		-38.80
14 MAY 1988	7295.50	5 55 54.9	27 30 50.4	0.4050	0.7227	-11.3342	-4.19	41.33	0.214		-35.88
19 MAY 1988	7300.50	6 0 55.5	27 8 25.1	0.3736	0.7234	-10.3219	-4.12	44.80	0.168		-32.16
24 MAY 1988	7305.50	6 1 49.7	26 35 4.4	0.3457	0.7241	-8.9827	-4.00	48.42	0.119		-27.53
29 MAY 1988	7310.50	5 58 17.7	25 49 55.6	0.3221	0.7247	-7.2525	-3.80	51.96	0.073		-21.90
3 JUN 1988	7315.50	5 50 28.6	24 52 1.7	0.3042	0.7254	-5.1109	-3.50	55.03	0.035		-15.27
8 JUN 1988	7320.50	5 39 15.0	23 41 45.4	0.2929	0.7260	-2.6273	-3.08	57.14	0.009		-7.84
13 JUN 1988	7325.50	5 26 14.8	22 22 37.8	0.2892	0.7265	0.0412	-2.60	57.88	0.000		-0.84
18 JUN 1988	7330.50	5 13 30.2	21 1 52.7	0.2932	0.7270	2.6964	-3.09	57.10	0.010		8.07
23 JUN 1988	7335.50	5 2 54.4	19 48 32.1	0.3046	0.7274	5.1446	-3.50	54.96	0.036		15.46
28 JUN 1988	7340.50	4 55 45.3	18 50 11.2	0.3225	0.7278	7.2500	-3.80	51.90	0.074		22.04
3 JUL 1988	7345.50	4 52 37.8	18 10 44.5	0.3460	0.7280	8.9561	-3.99	48.37	0.119		27.62
8 JUL 1988	7350.50	4 53 31.3	17 50 13.1	0.3739	0.7282	10.2715	-4.11	44.77	0.166		32.21
13 JUL 1988	7355.50	4 58 4.5	17 45 59.1	0.4050	0.7282	11.2575	-4.17	41.33	0.213		35.89
18 JUL 1988	7360.50	5 5 48.4	17 54 13.0	0.4387	0.7282	11.9933	-4.19	38.16	0.257		38.79

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	5 16 14.8	18 10 50.4	0.4741	0.7281	12.5397	-4.18	35.30	0.299	41.03
28 JUL 1988	7370.50	5 28 59.4	18 32 1.0	0.5109	0.7279	12.9384	-4.16	32.76	0.339	42.72
2 AUG 1988	7375.50	5 43 41.9	18 54 16.4	0.5487	0.7276	13.2085	-4.13	30.50	0.375	43.97
7 AUG 1988	7380.50	6 0 4.7	19 14 32.1	0.5871	0.7272	13.3679	-4.09	28.51	0.409	44.84
12 AUG 1988	7385.50	6 17 51.6	19 30 11.1	0.6258	0.7268	13.4498	-4.05	26.75	0.441	45.41
17 AUG 1988	7390.50	6 36 48.4	19 39 3.0	0.6647	0.7262	13.4798	-4.00	25.18	0.471	45.73
22 AUG 1988	7395.50	6 56 43.0	19 39 21.6	0.7037	0.7257	13.4715	-3.96	23.79	0.499	45.85
27 AUG 1988	7400.50	7 17 24.9	19 29 42.8	0.7425	0.7250	13.4280	-3.91	22.54	0.526	45.78
1 SEP 1988	7405.50	7 38 45.0	19 9 0.9	0.7812	0.7244	13.3439	-3.87	21.43	0.551	45.58
6 SEP 1988	7410.50	8 0 34.5	18 36 31.4	0.8195	0.7237	13.2185	-3.83	20.42	0.576	45.21
11 SEP 1988	7415.50	8 22 44.6	17 51 52.1	0.8575	0.7230	13.0860	-3.79	19.52	0.599	44.76
16 SEP 1988	7420.50	8 45 7.9	16 54 59.6	0.8950	0.7223	12.8999	-3.76	18.70	0.621	44.21
21 SEP 1988	7425.50	9 7 38.4	15 48 7.3	0.9320	0.7217	12.7247	-3.72	17.96	0.642	43.58
26 SEP 1988	7430.50	9 30 11.6	14 25 41.9	0.9685	0.7210	12.5374	-3.69	17.28	0.662	42.87
1 OCT 1988	7435.50	9 52 44.5	12 54 21.0	1.0044	0.7205	12.3267	-3.66	16.67	0.682	42.11
6 OCT 1988	7440.50	10 15 14.8	11 12 55.8	1.0396	0.7199	12.0900	-3.63	16.10	0.700	41.28
11 OCT 1988	7445.50	10 37 41.1	9 22 29.0	1.0742	0.7195	11.8388	-3.60	15.58	0.718	40.42
16 OCT 1988	7450.50	11 0 3.3	7 24 10.4	1.1080	0.7191	11.5825	-3.57	15.11	0.736	39.51
21 OCT 1988	7455.50	11 22 22.1	5 19 15.6	1.1411	0.7188	11.3259	-3.55	14.67	0.752	38.56
26 OCT 1988	7460.50	11 44 39.6	3 9 2.0	1.1734	0.7186	11.0643	-3.53	14.26	0.768	37.58
31 OCT 1988	7465.50	12 6 58.9	0 54 49.6	1.2050	0.7184	10.7847	-3.51	13.89	0.784	36.57
5 NOV 1988	7470.50	12 29 23.0	-1 21 55.1	1.2357	0.7184	10.4862	-3.49	13.55	0.799	35.54
10 NOV 1988	7475.50	12 51 55.3	-3 39 41.7	1.2655	0.7185	10.1785	-3.47	13.23	0.813	34.48
15 NOV 1988	7480.50	13 14 39.3	-5 58 57.4	1.2945	0.7187	9.8703	-3.45	12.93	0.826	33.41
20 NOV 1988	7485.50	13 37 38.7	-8 12 7.1	1.3225	0.7189	9.5681	-3.44	12.66	0.839	32.32
25 NOV 1988	7490.50	14 0 57.4	-10 23 36.6	1.3497	0.7193	9.2658	-3.43	12.40	0.851	31.22
30 NOV 1988	7495.50	14 24 39.3	-12 29 49.6	1.3760	0.7197	8.9507	-3.41	12.16	0.863	30.10
5 DEC 1988	7500.50	14 48 47.3	-14 29 6.0	1.4014	0.7202	8.6231	-3.40	11.94	0.874	28.97
10 DEC 1988	7505.50	15 13 23.6	-16 19 45.2	1.4258	0.7208	8.2904	-3.39	11.74	0.885	27.84
15 DEC 1988	7510.50	15 38 29.1	-18 0 7.5	1.4493	0.7214	7.9621	-3.38	11.55	0.895	26.69
20 DEC 1988	7515.50	16 4 3.6	-19 28 36.9	1.4718	0.7220	7.6455	-3.37	11.37	0.905	25.55
25 DEC 1988	7520.50	16 30 6.1	-20 43 45.0	1.4935	0.7227	7.3323	-3.37	11.21	0.914	24.39
30 DEC 1988	7525.50	16 56 34.0	-21 44 10.8	1.5142	0.7234	7.0107	-3.36	11.05	0.922	23.23

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1989	7530.50	17 23	23.0	-22-28-43.9	1.5339	0.7241	6.6807	-3.35	10.91	0.930	22.07
9 JAN 1989	7535.50	17 50	27.3	-22-56-29.7	1.5527	0.7247	6.3468	-3.35	10.78	0.937	20.91
14 JAN 1989	7540.50	18 17	39.8	-23 -8-51.2	1.5706	0.7254	6.0195	-3.35	10.66	0.944	19.74
19 JAN 1989	7545.50	18 44	53.1	-22-59-31.6	1.5875	0.7260	5.7054	-3.35	10.54	0.951	18.57
24 JAN 1989	7550.50	19 12	0.0	-22-34-35.2	1.6036	0.7265	5.3938	-3.35	10.44	0.957	17.40
29 JAN 1989	7555.50	19 38	53.7	-21-52-24.9	1.6187	0.7270	5.0741	-3.35	10.34	0.963	16.22
3 FEB 1989	7560.50	20 5	28.3	-20-53-42.3	1.6329	0.7274	4.7441	-3.35	10.25	0.968	15.05
8 FEB 1989	7565.50	20 31	38.9	-19-39-26.5	1.6481	0.7278	4.4061	-3.35	10.17	0.973	13.87
13 FEB 1989	7570.50	20 57	21.9	-18-10-49.3	1.6583	0.7280	4.0723	-3.36	10.09	0.977	12.68
18 FEB 1989	7575.50	21 22	35.7	-16-29-12.6	1.6696	0.7282	3.7468	-3.37	10.03	0.981	11.49
23 FEB 1989	7580.50	21 47	20.1	-14-36 -3.7	1.6799	0.7282	3.4183	-3.38	9.96	0.985	10.30
28 FEB 1989	7585.50	22 11	36.5	-12-32-52.6	1.6893	0.7282	3.0776	-3.39	9.91	0.988	9.10
5 MAR 1989	7590.50	22 35	27.6	-10-21-12.0	1.6977	0.7281	2.7197	-3.40	9.86	0.991	7.90
10 MAR 1989	7595.50	22 58	56.4	-8 -2-37.0	1.7050	0.7279	2.3471	-3.41	9.82	0.994	6.70
15 MAR 1989	7600.50	23 22	6.6	-5-38-41.7	1.7113	0.7276	1.9732	-3.42	9.78	0.996	5.50
20 MAR 1989	7605.50	23 45	2.9	-3-10-59.5	1.7164	0.7272	1.6004	-3.44	9.75	0.997	4.30
25 MAR 1989	7610.50	0 7	50.2	0-41 -0.8	1.7205	0.7267	1.2192	-3.46	9.73	0.999	3.13
30 MAR 1989	7615.50	0 30	33.9	1 49 45.7	1.7234	0.7262	0.8218	-3.48	9.71	0.999	2.04
4 APR 1989	7620.50	0 53	19.5	4 19 50.0	1.7252	0.7256	0.4013	-3.49	9.70	1.000	-1.30
9 APR 1989	7625.50	1 16	11.8	6 47 40.7	1.7257	0.7250	-0.0372	-3.48	9.70	1.000	-1.56
14 APR 1989	7630.50	1 39	15.8	9 11 46.1	1.7250	0.7243	-0.4792	-3.47	9.70	0.999	-2.54
19 APR 1989	7635.50	2 2	35.9	11 30 33.4	1.7230	0.7237	-0.9229	-3.45	9.71	0.998	-3.72
24 APR 1989	7640.50	2 26	16.3	13 42 31.3	1.7197	0.7230	-1.3736	-3.44	9.73	0.996	-4.97
29 APR 1989	7645.50	2 50	20.8	15 46 8.2	1.7150	0.7223	-1.8384	-3.42	9.76	0.994	-6.25
4 MAY 1989	7650.50	3 14	51.9	17 39 50.7	1.7090	0.7216	-2.3246	-3.40	9.79	0.992	-7.55
9 MAY 1989	7655.50	3 39	50.9	19 22 6.7	1.7016	0.7210	-2.8233	-3.39	9.84	0.988	-8.86
14 MAY 1989	7660.50	4 5	17.4	20 51 27.4	1.6927	0.7204	-3.3201	-3.38	9.89	0.984	-10.18
19 MAY 1989	7665.50	4 31	9.9	22 6 29.9	1.6824	0.7199	-3.8119	-3.37	9.95	0.980	-11.50
24 MAY 1989	7670.50	4 57	25.2	23 6 1.7	1.6707	0.7194	-4.2999	-3.36	10.02	0.975	-12.84
29 MAY 1989	7675.50	5 23	59.0	23 49 1.9	1.6576	0.7191	-4.7922	-3.35	10.10	0.969	-14.17
3 JUN 1989	7680.50	5 50	45.3	24 14 43.1	1.6430	0.7188	-5.2950	-3.34	10.19	0.963	-15.51
8 JUN 1989	7685.50	6 17	37.0	24 22 36.5	1.6270	0.7186	-5.7973	-3.34	10.29	0.958	-16.85
13 JUN 1989	7690.50	6 44	26.0	24 12 32.5	1.6095	0.7184	-6.2864	-3.33	10.40	0.949	-18.19
18 JUN 1989	7695.50	7 11	4.7	23 44 41.3	1.5907	0.7184	-6.7572	-3.33	10.52	0.941	-19.52
23 JUN 1989	7700.50	7 37	26.2	22 59 33.1	1.5705	0.7185	-7.2096	-3.33	10.66	0.932	-20.85
28 JUN 1989	7705.50	8 3	24.6	21 57 53.7	1.5491	0.7187	-7.6540	-3.33	10.81	0.923	-22.18
3 JUL 1989	7710.50	8 28	55.5	20 40 43.4	1.5263	0.7189	-8.0959	-3.33	10.97	0.913	-23.49
8 JUL 1989	7715.50	8 53	55.7	19 9 16.0	1.5023	0.7193	-8.5252	-3.33	11.14	0.903	-24.79
13 JUL 1989	7720.50	9 18	23.1	17 24 53.4	1.4771	0.7197	-8.9320	-3.34	11.33	0.892	-26.08
18 JUL 1989	7725.50	9 42	17.7	15 29 2.7	1.4508	0.7202	-9.3099	-3.34	11.54	0.881	-27.36

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1989	7730.50	10 5	40.7	13 23 13.2	1.4234	0.7208	-9.6603	-3.35	11.76	0.889	-28.63
28 JUL 1989	7735.50	10 28	34.9	11 8 53.3	1.3950	0.7214	-9.9965	-3.36	12.00	0.857	-29.87
2 AUG 1989	7740.50	10 51	3.5	8 47 31.8	1.3656	0.7221	-10.3240	-3.37	12.28	0.844	-31.10
7 AUG 1989	7745.50	11 13	10.2	6 20 38.5	1.3354	0.7227	-10.6358	-3.39	12.53	0.831	-32.30
12 AUG 1989	7750.50	11 34	59.1	3 49 42.0	1.3042	0.7234	-10.9237	-3.40	12.83	0.817	-33.49
17 AUG 1989	7755.50	11 56	34.8	1 16 8.9	1.2723	0.7241	-11.1810	-3.42	13.16	0.803	-34.65
22 AUG 1989	7760.50	12 18	1.9	-1 18 38.4	1.2397	0.7248	-11.4116	-3.44	13.50	0.789	-35.78
27 AUG 1989	7765.50	12 39	25.8	-3 53 12.9	1.2064	0.7254	-11.6304	-3.46	13.87	0.774	-36.98
1 SEP 1989	7770.50	13 0	51.4	-6 26 17.9	1.1725	0.7260	-11.8425	-3.49	14.28	0.759	-37.95
6 SEP 1989	7775.50	13 22	22.9	-8 56 26.7	1.1380	0.7265	-12.0435	-3.51	14.71	0.744	-38.99
11 SEP 1989	7780.50	13 44	4.3	-11 22 13.4	1.1030	0.7270	-12.2257	-3.54	15.18	0.728	-39.99
16 SEP 1989	7785.50	14 5	59.1	-13 42 12.0	1.0675	0.7274	-12.3807	-3.57	15.68	0.712	-40.95
21 SEP 1989	7790.50	14 28	10.2	-15 54 57.7	1.0315	0.7278	-12.5147	-3.61	16.23	0.695	-41.87
26 SEP 1989	7795.50	14 50	40.3	-17 59 8.0	0.9952	0.7280	-12.6413	-3.64	16.82	0.678	-42.74
1 OCT 1989	7800.50	15 13	30.3	-19 53 19.1	0.9585	0.7282	-12.7645	-3.68	17.46	0.660	-43.56
6 OCT 1989	7805.50	15 36	39.7	-21 36 9.0	0.9215	0.7282	-12.8808	-3.72	18.17	0.642	-44.32
11 OCT 1989	7810.50	16 0	6.0	-23 6 20.3	0.8841	0.7282	-12.9797	-3.77	18.93	0.622	-45.01
16 OCT 1989	7815.50	16 23	44.7	-24 22 43.2	0.8465	0.7281	-13.0513	-3.81	19.77	0.603	-45.63
21 OCT 1989	7820.50	16 47	30.1	-25 24 21.4	0.8088	0.7279	-13.1015	-3.86	20.70	0.582	-46.16
26 OCT 1989	7825.50	17 11	14.9	-26 10 33.0	0.7709	0.7275	-13.1403	-3.91	21.71	0.560	-46.60
31 OCT 1989	7830.50	17 34	49.6	-26 40 52.0	0.7329	0.7272	-13.1691	-3.97	22.84	0.538	-46.92
5 NOV 1989	7835.50	17 58	2.7	-26 55 12.7	0.6948	0.7267	-13.1815	-4.02	24.09	0.514	-47.11
10 NOV 1989	7840.50	18 20	40.7	-26 53 51.4	0.6568	0.7262	-13.1605	-4.08	25.49	0.489	-47.15
15 NOV 1989	7845.50	18 42	29.4	-26 37 26.9	0.6189	0.7256	-13.0921	-4.13	27.05	0.462	-47.01
20 NOV 1989	7850.50	19 3	14.2	-26 7 1.2	0.5812	0.7250	-12.9767	-4.19	28.80	0.433	-46.84
25 NOV 1989	7855.50	19 22	40.3	-25 23 55.0	0.5440	0.7243	-12.8140	-4.24	30.77	0.402	-46.02
30 NOV 1989	7860.50	19 40	31.5	-24 29 49.1	0.5073	0.7236	-12.5944	-4.29	33.00	0.369	-45.09
5 DEC 1989	7865.50	19 58	28.7	-23 26 44.5	0.4713	0.7229	-12.2941	-4.34	35.52	0.334	-43.78
10 DEC 1989	7870.50	20 10	10.3	-22 16 59.1	0.4364	0.7222	-11.8725	-4.37	38.36	0.296	-42.02
15 DEC 1989	7875.50	20 21	11.8	-21 3 6.0	0.4029	0.7216	-11.2901	-4.38	41.55	0.254	-39.69
20 DEC 1989	7880.50	20 29	7.0	-19 47 48.8	0.3714	0.7210	-10.5138	-4.37	45.07	0.210	-36.68
25 DEC 1989	7885.50	20 33	28.8	-18 33 59.2	0.3424	0.7204	-9.5003	-4.31	48.89	0.164	-32.88
30 DEC 1989	7890.50	20 33	51.2	-17 24 39.1	0.3168	0.7199	-8.1939	-4.20	52.84	0.118	-28.18

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	20 29 57.5	-16-22-52.6	0.2954	0.7194	-6.5326	-4.01	56.66	0.074	-22.54	
9 JAN 1990	7900.50	20 21 55.5	-15-31-26.9	0.2794	0.7190	-4.4822	-3.73	59.90	0.037	-16.08	
14 JAN 1990	7905.50	20 10 35.2	-14-52-28.1	0.2699	0.7188	-2.1005	-3.38	62.03	0.013	-9.47	
19 JAN 1990	7910.50	19 57 34.5	-14-26-57.3	0.2675	0.7186	0.4504	-3.17	62.58	0.005	6.13	
24 JAN 1990	7915.50	19 44 59.2	-14-14-44.5	0.2724	0.7185	2.9598	-3.44	61.45	0.016	10.66	
29 JAN 1990	7920.50	19 34 46.2	-14-14-30.3	0.2843	0.7185	5.2432	-3.78	58.87	0.043	17.28	
3 FEB 1990	7925.50	19 28 13.8	-14-23-47.5	0.3024	0.7185	7.2432	-4.03	55.36	0.081	23.51	
8 FEB 1990	7930.50	19 25 58.0	-14-39-19.5	0.3256	0.7187	8.8013	-4.20	51.41	0.128	28.88	
13 FEB 1990	7935.50	19 27 51.0	-14-57-25.2	0.3529	0.7190	10.0597	-4.29	47.43	0.172	33.31	
18 FEB 1990	7940.50	19 33 35.6	-15-14-28.2	0.3834	0.7194	11.0186	-4.33	43.66	0.217	36.87	
23 FEB 1990	7945.50	19 42 37.0	-15-27-21.7	0.4163	0.7198	11.7410	-4.34	40.21	0.260	39.66	
28 FEB 1990	7950.50	19 54 20.7	-15-33-34.8	0.4510	0.7203	12.2882	-4.32	37.11	0.301	41.83	
5 MAR 1990	7955.50	20 8 15.6	-15-31-10.3	0.4871	0.7209	12.7108	-4.29	34.36	0.339	43.47	
10 MAR 1990	7960.50	20 23 58.0	-15-18-39.8	0.5243	0.7215	13.0352	-4.24	31.92	0.374	44.68	
15 MAR 1990	7965.50	20 40 00.0	-14-55-06.6	0.5623	0.7222	13.2692	-4.19	29.77	0.407	45.52	
20 MAR 1990	7970.50	20 59 9.0	-14-19-36.8	0.6009	0.7228	13.4252	-4.14	27.86	0.438	46.07	
25 MAR 1990	7975.50	21 18 7.0	-13-32-20.5	0.6398	0.7235	13.5215	-4.08	26.18	0.467	46.38	
30 MAR 1990	7980.50	21 37 40.4	-12-33-25.7	0.6790	0.7242	13.5778	-4.03	24.65	0.494	46.48	
4 APR 1990	7985.50	21 57 38.8	-11-23-22.3	0.7182	0.7249	13.6088	-3.97	23.31	0.520	46.41	
9 APR 1990	7990.50	22 17 55.0	-10-2-50.7	0.7575	0.7255	13.6130	-3.92	22.10	0.544	46.18	
14 APR 1990	7995.50	22 38 23.7	-8-32-40.2	0.7968	0.7261	13.5807	-3.86	21.01	0.568	45.83	
19 APR 1990	8000.50	22 59 1.2	-6-53-50.9	0.8359	0.7266	13.5121	-3.81	20.02	0.590	45.37	
24 APR 1990	8005.50	23 19 45.0	-5-7-32.5	0.8748	0.7271	13.4141	-3.77	19.13	0.611	44.82	
29 APR 1990	8010.50	23 40 33.6	-3-15-06.6	0.9134	0.7275	13.2992	-3.72	18.33	0.631	44.19	
4 MAY 1990	8015.50	0 1 27.1	-1-17-32.3	0.9516	0.7278	13.1758	-3.68	17.59	0.651	43.48	
9 MAY 1990	8020.50	0 22 26.9	0 43 36.4	0.9895	0.7280	13.0359	-3.64	16.92	0.670	42.70	
14 MAY 1990	8025.50	0 43 35.3	2 47 8.3	1.0269	0.7282	12.8690	-3.60	16.30	0.688	41.87	
19 MAY 1990	8030.50	1 4 54.8	4 51 43.0	1.0638	0.7282	12.6729	-3.57	15.74	0.706	40.98	
24 MAY 1990	8035.50	1 26 28.0	6 55 58.0	1.1000	0.7282	12.4519	-3.53	15.22	0.723	40.05	
29 MAY 1990	8040.50	1 48 17.4	8 58 21.9	1.1357	0.7280	12.2185	-3.50	14.74	0.740	39.08	
3 JUN 1990	8045.50	2 10 25.8	10 57 35.0	1.1706	0.7278	11.9793	-3.48	14.30	0.756	38.07	
8 JUN 1990	8050.50	2 32 58.4	12 52 11.1	1.2048	0.7275	11.7252	-3.45	13.89	0.771	37.03	
13 JUN 1990	8055.50	2 55 52.0	14 40 45.4	1.2383	0.7271	11.4474	-3.43	13.52	0.786	35.95	
18 JUN 1990	8060.50	3 19 14.6	16 21 50.6	1.2709	0.7266	11.1421	-3.41	13.17	0.801	34.84	
23 JUN 1990	8065.50	3 43 5.3	17 53 59.1	1.3026	0.7261	10.8136	-3.39	12.85	0.815	33.71	
28 JUN 1990	8070.50	4 7 24.1	19 15 45.4	1.3334	0.7255	10.4761	-3.38	12.55	0.828	32.56	
3 JUL 1990	8075.50	4 32 10.1	20 25 48.3	1.3631	0.7249	10.1346	-3.36	12.28	0.842	31.38	
8 JUL 1990	8080.50	4 57 21.4	21 22 54.0	1.3919	0.7242	9.7814	-3.35	12.03	0.854	30.18	
13 JUL 1990	8085.50	5 22 55.1	22 5 58.6	1.4198	0.7235	9.4093	-3.34	11.79	0.866	28.96	
18 JUL 1990	8090.50	5 48 47.1	22 33 59.7	1.4462	0.7228	9.0130	-3.33	11.57	0.878	27.73	

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	6 14 51.7	22 46 20.9	1.4716	0.7222	8.5981	-3.33	11.37	0.889	26.49
28 JUL 1990	8100.50	6 41 2.5	22 42 33.6	1.4959	0.7215	8.1801	-3.33	11.19	0.900	25.23
2 AUG 1990	8105.50	7 7 13.2	22 22 28.3	1.5189	0.7209	7.7628	-3.32	11.02	0.910	23.98
7 AUG 1990	8110.50	7 33 17.7	21 46 13.4	1.5407	0.7203	7.3406	-3.32	10.86	0.920	22.68
12 AUG 1990	8115.50	7 59 10.5	20 54 12.2	1.5613	0.7198	6.9074	-3.33	10.72	0.929	21.39
17 AUG 1990	8120.50	8 24 47.2	19 47 3.6	1.5806	0.7194	6.4562	-3.33	10.59	0.938	20.09
22 AUG 1990	8125.50	8 50 4.0	18 26 42.0	1.5985	0.7190	5.9948	-3.33	10.47	0.946	18.79
27 AUG 1990	8130.50	9 14 58.3	16 51 12.3	1.6152	0.7187	5.5379	-3.34	10.36	0.953	17.49
1 SEP 1990	8135.50	9 39 29.1	15 4 48.6	1.6305	0.7185	5.0887	-3.35	10.27	0.960	16.18
6 SEP 1990	8140.50	10 3 36.8	13 7 50.6	1.6446	0.7184	4.6448	-3.35	10.18	0.966	14.86
11 SEP 1990	8145.50	10 27 23.2	11 1 40.5	1.6574	0.7185	4.1983	-3.36	10.10	0.972	13.55
16 SEP 1990	8150.50	10 50 51.0	8 47 44.5	1.6688	0.7186	3.7414	-3.38	10.03	0.977	12.24
21 SEP 1990	8155.50	11 14 3.4	6 27 32.5	1.6790	0.7187	3.2832	-3.39	9.97	0.982	10.93
26 SEP 1990	8160.50	11 37 4.1	4 2 35.2	1.6878	0.7190	2.8361	-3.40	9.92	0.986	9.63
1 OCT 1990	8165.50	11 59 57.5	1 34 24.3	1.6954	0.7194	2.4036	-3.41	9.87	0.990	8.32
6 OCT 1990	8170.50	12 22 48.5	0 55 29.6	1.7017	0.7199	1.9850	-3.43	9.84	0.993	7.03
11 OCT 1990	8175.50	12 45 42.5	-3 25 36.1	1.7068	0.7204	1.5691	-3.45	9.81	0.995	5.74
16 OCT 1990	8180.50	13 8 44.6	-5 54 22.2	1.7108	0.7209	1.1484	-3.46	9.78	0.997	4.46
21 OCT 1990	8185.50	13 31 59.7	-8 20 11.8	1.7135	0.7216	0.7317	-3.48	9.77	0.999	3.21
26 OCT 1990	8190.50	13 55 32.4	-10 41 27.4	1.7150	0.7222	0.3282	-3.50	9.76	0.999	2.00
31 OCT 1990	8195.50	14 19 26.9	-12 56 29.5	1.7154	0.7229	-0.0572	-3.51	9.76	1.000	1.01
5 NOV 1990	8200.50	14 43 47.1	-15 3 39.1	1.7147	0.7236	-0.4256	-3.51	9.76	1.000	-1.15
10 NOV 1990	8205.50	15 8 35.9	-17 1 17.2	1.7129	0.7243	-0.7910	-3.49	9.77	0.999	-2.19
15 NOV 1990	8210.50	15 33 55.2	-18 47 43.9	1.7101	0.7249	-1.1601	-3.47	9.79	0.998	-3.38
20 NOV 1990	8215.50	15 59 45.3	-20 21 21.6	1.7062	0.7255	-1.5257	-3.45	9.81	0.997	-4.60
25 NOV 1990	8220.50	16 26 4.7	-21 40 38.0	1.7013	0.7261	-1.8810	-3.44	9.84	0.995	-5.82
30 NOV 1990	8225.50	16 52 50.0	-22 44 9.7	1.6954	0.7267	-2.2191	-3.42	9.87	0.993	-7.04
5 DEC 1990	8230.50	17 19 57.0	-23 30 46.6	1.6885	0.7271	-2.5429	-3.41	9.91	0.990	-8.26
10 DEC 1990	8235.50	17 47 19.4	-23 59 34.2	1.6807	0.7275	-2.8678	-3.39	9.96	0.987	-9.47
15 DEC 1990	8240.50	18 14 50.2	-24 9 55.6	1.6719	0.7278	-3.1992	-3.38	10.01	0.984	-10.67
20 DEC 1990	8245.50	18 42 21.1	-24 1 35.8	1.6622	0.7281	-3.5326	-3.37	10.07	0.980	-11.87
25 DEC 1990	8250.50	19 9 43.7	-23 34 41.9	1.6515	0.7282	-3.8615	-3.36	10.14	0.976	-13.06
30 DEC 1990	8255.50	19 36 50.2	-22 49 42.3	1.6399	0.7282	-4.1772	-3.35	10.21	0.972	-14.25

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (ⁿ)	PHASE	ELONG
4 JAN 1991	8260.50	20 3 34.2	-21-47-25.7	1.6274	0.7282	-4.4851	-3.35	10.29	0.967		-15.43
9 JAN 1991	8265.50	20 29 50.7	-20-28-55.9	1.6140	0.7280	-4.7998	-3.34	10.37	0.961		-16.60
14 JAN 1991	8270.50	20 55 36.5	-18-55-29.9	1.5997	0.7278	-5.1258	-3.34	10.46	0.955		-17.77
19 JAN 1991	8275.50	21 20 49.8	-17 8-35.7	1.5844	0.7275	-5.4608	-3.34	10.56	0.949		-18.93
24 JAN 1991	8280.50	21 45 30.2	-15 9-48.3	1.5681	0.7271	-5.7971	-3.34	10.67	0.943		-20.09
29 JAN 1991	8285.50	22 9 38.9	-13 0-45.6	1.5509	0.7268	-6.1248	-3.34	10.79	0.938		-21.24
3 FEB 1991	8290.50	22 33 18.4	-10-43 -6.5	1.5328	0.7260	-6.4508	-3.34	10.92	0.928		-22.39
8 FEB 1991	8295.50	22 56 32.6	-8-18-27.6	1.5137	0.7255	-6.7871	-3.35	11.06	0.920		-23.53
13 FEB 1991	8300.50	23 19 25.8	-5-48-24.9	1.4936	0.7248	-7.1379	-3.35	11.21	0.911		-24.67
18 FEB 1991	8305.50	23 42 2.6	-3-14-35.1	1.4724	0.7242	-7.5023	-3.36	11.37	0.902		-25.80
23 FEB 1991	8310.50	0 4 27.7	0-38-33.4	1.4502	0.7235	-7.8689	-3.37	11.54	0.893		-26.92
28 FEB 1991	8315.50	0 26 46.1	1 58 6.1	1.4270	0.7228	-8.2278	-3.38	11.73	0.882		-28.04
5 MAR 1991	8320.50	0 49 3.0	4 33 51.8	1.4027	0.7221	-8.5853	-3.39	11.93	0.872		-29.16
10 MAR 1991	8325.50	1 11 23.6	7 7 14.9	1.3774	0.7215	-8.9499	-3.40	12.15	0.860		-30.26
15 MAR 1991	8330.50	1 33 52.9	9 36 44.9	1.3510	0.7208	-9.3263	-3.41	12.39	0.848		-31.36
20 MAR 1991	8335.50	1 56 35.2	12 0 50.1	1.3235	0.7203	-9.7125	-3.42	12.65	0.835		-32.44
25 MAR 1991	8340.50	2 19 33.8	14 17 58.4	1.2949	0.7198	-10.0939	-3.44	12.93	0.822		-33.52
30 MAR 1991	8345.50	2 42 51.5	16 26 37.9	1.2652	0.7193	-10.4808	-3.46	13.23	0.808		-34.58
4 APR 1991	8350.50	3 6 30.1	18 25 26.4	1.2345	0.7190	-10.8175	-3.48	13.56	0.793		-35.62
9 APR 1991	8355.50	3 30 30.8	20 12 41.5	1.2028	0.7187	-11.1700	-3.50	13.92	0.778		-36.64
14 APR 1991	8360.50	3 54 53.0	21 47 20.0	1.1700	0.7185	-11.5237	-3.52	14.31	0.762		-37.64
19 APR 1991	8365.50	4 19 34.3	23 8 1.1	1.1362	0.7184	-11.8750	-3.54	14.73	0.745		-38.61
24 APR 1991	8370.50	4 44 30.3	24 13 40.2	1.1014	0.7184	-12.2074	-3.57	15.20	0.727		-39.55
29 APR 1991	8375.50	5 9 35.0	25 3 25.0	1.0657	0.7186	-12.5121	-3.60	15.71	0.708		-40.45
4 MAY 1991	8380.50	5 34 41.3	25 36 41.3	1.0292	0.7188	-12.7912	-3.63	16.26	0.689		-41.30
9 MAY 1991	8385.50	5 59 41.4	25 53 12.4	0.9919	0.7190	-13.0504	-3.66	16.88	0.669		-42.10
14 MAY 1991	8390.50	6 24 26.7	25 52 59.8	0.9538	0.7194	-13.2984	-3.69	17.55	0.648		-42.85
19 MAY 1991	8395.50	6 48 47.7	25 36 25.3	0.9161	0.7199	-13.5233	-3.73	18.29	0.628		-43.52
24 MAY 1991	8400.50	7 12 34.8	25 4 10.3	0.8758	0.7204	-13.7147	-3.77	19.11	0.603		-44.12
29 MAY 1991	8405.50	7 35 39.1	24 17 13.4	0.8359	0.7210	-13.8620	-3.81	20.02	0.579		-44.62
3 JUN 1991	8410.50	7 57 52.8	23 16 47.7	0.7957	0.7216	-13.9851	-3.85	21.04	0.555		-45.01
8 JUN 1991	8415.50	8 19 9.3	22 4 16.8	0.7553	0.7222	-14.0297	-3.89	22.16	0.528		-45.27
13 JUN 1991	8420.50	8 39 22.3	20 41 13.1	0.7147	0.7229	-14.0612	-3.94	23.42	0.501		-45.39
18 JUN 1991	8425.50	8 58 25.5	19 9 19.2	0.6741	0.7236	-14.0484	-3.98	24.83	0.472		-45.33
23 JUN 1991	8430.50	9 16 11.3	17 30 25.7	0.6337	0.7243	-13.9709	-4.03	26.42	0.442		-45.06
28 JUN 1991	8435.50	9 32 31.9	15 46 29.1	0.5935	0.7249	-13.8142	-4.07	28.20	0.410		-44.54
3 JUL 1991	8440.50	9 47 18.5	13 59 30.3	0.5540	0.7256	-13.5685	-4.12	30.22	0.375		-43.72
8 JUL 1991	8445.50	10 0 20.8	12 11 36.5	0.5153	0.7262	-13.2292	-4.15	32.49	0.339		-42.55
13 JUL 1991	8450.50	10 11 25.2	10 25 9.0	0.4777	0.7267	-12.7834	-4.18	35.04	0.300		-40.95
18 JUL 1991	8455.50	10 20 13.7	8 42 53.1	0.4416	0.7271	-12.1927	-4.18	37.91	0.259		-38.84

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1991	8460.50	10 26 24.3	7 8 3.8	0.4074	0.7275	-11.4058	-4.17	41.08	0.216	-36.11
28 JUL 1991	8465.50	10 29 33.2	5 44 27.3	0.3759	0.7278	-10.3714	-4.12	44.53	0.171	-32.87
2 AUG 1991	8470.50	10 29 18.7	4 36 17.4	0.3478	0.7281	-9.0448	-4.03	48.12	0.126	-28.42
7 AUG 1991	8475.50	10 26 28.5	3 48 2.5	0.3240	0.7282	-7.3984	-3.88	51.68	0.083	-23.36
12 AUG 1991	8480.50	10 18 8.6	3 23 49.1	0.3054	0.7282	-5.4125	-3.63	54.80	0.047	-17.62
17 AUG 1991	8485.50	10 7 55.0	3 28 6.0	0.2931	0.7282	-3.1134	-3.34	57.12	0.021	-11.83
22 AUG 1991	8490.50	9 56 2.0	3 53 58.1	0.2877	0.7280	-0.6028	-3.14	58.19	0.010	8.27
27 AUG 1991	8495.50	9 44 14.0	4 42 2.4	0.2896	0.7278	1.9356	-3.28	57.80	0.017	10.64
1 SEP 1991	8500.50	9 34 18.7	5 41 29.3	0.2987	0.7275	4.2988	-3.59	56.04	0.039	16.28
6 SEP 1991	8505.50	9 27 36.4	6 42 49.2	0.3141	0.7271	6.3403	-3.86	53.29	0.074	22.20
11 SEP 1991	8510.50	9 24 45.9	7 38 19.4	0.3349	0.7266	8.0186	-4.05	49.98	0.116	27.54
16 SEP 1991	8515.50	9 25 50.8	8 22 50.4	0.3601	0.7260	9.3605	-4.17	46.48	0.161	32.08
21 SEP 1991	8520.50	9 30 33.6	8 53 21.0	0.3887	0.7255	10.4086	-4.24	43.08	0.207	35.81
26 SEP 1991	8525.50	9 38 27.1	9 8 17.9	0.4200	0.7248	11.2070	-4.26	39.86	0.251	38.79
1 OCT 1991	8530.50	9 49 1.3	9 7 7.8	0.4532	0.7242	11.7971	-4.27	36.93	0.292	41.13
6 OCT 1991	8535.50	10 1 46.8	8 50 2.5	0.4880	0.7235	12.2222	-4.25	34.30	0.331	42.93
11 OCT 1991	8540.50	10 16 17.0	8 17 41.2	0.5237	0.7228	12.5311	-4.22	31.96	0.368	44.27
16 OCT 1991	8545.50	10 32 10.2	7 30 57.5	0.5602	0.7221	12.7588	-4.18	29.88	0.402	45.25
21 OCT 1991	8550.50	10 49 9.5	6 30 51.9	0.5973	0.7215	12.9184	-4.14	28.02	0.434	45.91
26 OCT 1991	8555.50	11 7 2.1	5 18 30.1	0.6348	0.7209	13.0149	-4.10	26.37	0.464	46.32
31 OCT 1991	8560.50	11 25 38.0	3 55 7.2	0.6724	0.7203	13.0506	-4.05	24.89	0.492	46.50
5 NOV 1991	8565.50	11 44 49.2	2 22 9.7	0.7101	0.7198	13.0366	-4.01	23.57	0.519	46.49
10 NOV 1991	8570.50	12 4 29.9	0 41 9.5	0.7477	0.7194	12.9936	-3.96	22.39	0.544	46.34
15 NOV 1991	8575.50	12 24 36.4	-1 -8-19.4	0.7851	0.7190	12.9317	-3.92	21.32	0.569	46.05
20 NOV 1991	8580.50	12 45 7.2	-2-58-43.4	0.8224	0.7187	12.8493	-3.88	20.35	0.592	45.65
25 NOV 1991	8585.50	13 6 2.3	-4-54-28.8	0.8593	0.7185	12.7408	-3.84	19.48	0.613	45.14
30 NOV 1991	8590.50	13 27 22.3	-6-51-57.2	0.8959	0.7185	12.5995	-3.80	18.68	0.634	44.55
5 DEC 1991	8595.50	13 49 8.0	-8-49-25.0	0.9321	0.7185	12.4330	-3.76	17.96	0.654	43.89
10 DEC 1991	8600.50	14 11 20.5	-10-45 -7.8	0.9677	0.7188	12.2665	-3.72	17.30	0.674	43.17
15 DEC 1991	8605.50	14 34 1.2	-12-37-21.1	1.0029	0.7188	12.0757	-3.69	16.69	0.692	42.40
20 DEC 1991	8610.50	14 57 11.7	-14-24-22.3	1.0375	0.7191	11.8863	-3.66	16.13	0.710	41.57
25 DEC 1991	8615.50	15 20 53.5	-16 -4-30.9	1.0715	0.7194	11.6860	-3.62	15.62	0.726	40.70
30 DEC 1991	8620.50	15 45 7.0	-17-36 -4.7	1.1049	0.7199	11.4612	-3.59	15.15	0.743	39.79

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (ⁿ)	PHASE	ELONG
4 JAN 1992	8625.50	16 9 51.8	-18-57-24.5	1.1377	0.7204	11.2220	-3.57	14.71	0.758	38.86
9 JAN 1992	8630.50	16 35 5.6	-20 -6-57.2	1.1697	0.7210	10.9812	-3.54	14.31	0.773	37.89
14 JAN 1992	8635.50	17 0 45.5	-21 -3-18.6	1.2011	0.7216	10.7436	-3.51	13.94	0.787	36.90
19 JAN 1992	8640.50	17 26 47.5	-21-45-17.1	1.2318	0.7222	10.5075	-3.49	13.59	0.801	35.89
24 JAN 1992	8645.50	17 53 6.6	-22-11-54.5	1.2618	0.7229	10.2626	-3.47	13.27	0.814	34.85
29 JAN 1992	8650.50	18 19 36.9	-22-22-27.6	1.2910	0.7236	10.0007	-3.45	12.97	0.827	33.80
3 FEB 1992	8655.50	18 46 11.3	-22-16-32.5	1.3195	0.7243	9.7301	-3.43	12.69	0.839	32.73
8 FEB 1992	8660.50	19 12 42.7	-21-54 -4.9	1.3472	0.7249	9.4607	-3.41	12.42	0.850	31.65
13 FEB 1992	8665.50	19 39 4.2	-21-15-20.1	1.3742	0.7256	9.1972	-3.39	12.18	0.861	30.55
18 FEB 1992	8670.50	20 5 10.1	-20-20-51.2	1.4004	0.7261	8.9379	-3.38	11.95	0.872	29.44
23 FEB 1992	8675.50	20 30 58.1	-19-11-25.8	1.4258	0.7267	8.6693	-3.36	11.74	0.882	28.31
28 FEB 1992	8680.50	20 56 18.8	-17-48 -4.9	1.4504	0.7271	8.3837	-3.35	11.54	0.891	27.17
4 MAR 1992	8685.50	21 21 16.2	-16-12 -1.1	1.4742	0.7275	8.0882	-3.34	11.35	0.901	26.02
9 MAR 1992	8690.50	21 45 47.3	-14-24-35.2	1.4971	0.7278	7.7901	-3.33	11.18	0.910	24.86
14 MAR 1992	8695.50	22 9 52.7	-12-27-12.7	1.5192	0.7280	7.4953	-3.33	11.02	0.918	23.69
19 MAR 1992	8700.50	22 33 34.3	-10-21-20.9	1.5404	0.7282	7.2008	-3.32	10.87	0.926	22.50
24 MAR 1992	8705.50	22 56 55.3	-8 -8-26.5	1.5608	0.7282	6.8912	-3.32	10.72	0.934	21.29
29 MAR 1992	8710.50	23 19 59.3	-5-49-57.7	1.5802	0.7281	6.5806	-3.31	10.59	0.941	20.08
3 APR 1992	8715.50	23 42 50.4	-3-27-23.8	1.5987	0.7280	6.2141	-3.31	10.47	0.948	18.85
8 APR 1992	8720.50	0 5 32.8	-1 -2-14.1	1.6161	0.7278	5.8583	-3.32	10.36	0.955	17.62
13 APR 1992	8725.50	0 28 11.3	1 24 2.8	1.6325	0.7274	5.5015	-3.32	10.25	0.961	16.36
18 APR 1992	8730.50	0 50 50.8	3 50 0.2	1.6479	0.7270	5.1392	-3.32	10.16	0.967	15.10
23 APR 1992	8735.50	1 13 36.7	6 14 12.3	1.6621	0.7266	4.7571	-3.33	10.07	0.972	13.82
28 APR 1992	8740.50	1 36 33.8	8 35 11.4	1.6753	0.7260	4.3512	-3.34	9.99	0.977	12.53
3 MAY 1992	8745.50	1 59 46.6	10 51 27.7	1.6873	0.7254	3.9249	-3.35	9.92	0.981	11.23
8 MAY 1992	8750.50	2 23 19.0	13 1 29.9	1.6980	0.7248	3.4867	-3.36	9.86	0.985	9.91
13 MAY 1992	8755.50	2 47 14.3	15 3 46.1	1.7074	0.7241	3.0473	-3.38	9.80	0.989	8.59
18 MAY 1992	8760.50	3 11 35.4	16 56 46.0	1.7158	0.7234	2.6018	-3.40	9.76	0.992	7.25
23 MAY 1992	8765.50	3 36 24.0	18 39 0.6	1.7224	0.7228	2.1387	-3.41	9.72	0.995	5.91
28 MAY 1992	8770.50	4 1 40.7	20 9 2.1	1.7279	0.7221	1.6557	-3.43	9.69	0.997	4.55
2 JUN 1992	8775.50	4 27 24.5	21 25 27.1	1.7319	0.7215	1.1550	-3.46	9.66	0.998	3.19
7 JUN 1992	8780.50	4 53 32.5	22 26 59.7	1.7346	0.7208	0.6484	-3.48	9.65	0.999	1.83
12 JUN 1992	8785.50	5 20 0.5	23 12 34.6	1.7357	0.7203	0.1480	-3.51	9.64	1.000	0.47
17 JUN 1992	8790.50	5 46 43.2	23 41 21.3	1.7354	0.7198	-0.3511	-3.50	9.65	1.000	-0.95
22 JUN 1992	8795.50	6 13 34.4	23 52 45.0	1.7337	0.7193	-0.8588	-3.48	9.66	0.999	-2.33
27 JUN 1992	8800.50	6 40 26.9	23 48 28.5	1.7305	0.7190	-1.3717	-3.46	9.67	0.998	-3.71
2 JUL 1992	8805.50	7 7 13.7	23 22 34.2	1.7257	0.7187	-1.8944	-3.44	9.70	0.996	-5.10
7 JUL 1992	8810.50	7 33 47.2	22 41 24.0	1.7195	0.7185	-2.4103	-3.42	9.73	0.994	-6.48
12 JUL 1992	8815.50	8 0 1.5	21 43 37.7	1.7118	0.7185	-2.9084	-3.40	9.78	0.991	-7.87
17 JUL 1992	8820.50	8 25 51.6	20 30 10.8	1.7027	0.7185	-3.3930	-3.39	9.83	0.987	-9.25

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1992	8825.50	8 51	14.5	19 2	9.9	0.7186	-3.8700	-3.37	9.89	0.983	-10.63
27 JUL 1992	8830.50	9 16	8.5	17 20	51.0	0.7188	-4.3452	-3.36	9.96	0.978	-12.01
1 AUG 1992	8835.50	9 40	33.1	15 27	38.8	0.7191	-4.8175	-3.35	10.04	0.973	-13.37
6 AUG 1992	8840.50	10 4	29.2	13 24	2.3	0.7195	-5.2718	-3.34	10.13	0.967	-14.73
11 AUG 1992	8845.50	10 27	58.7	11 11	32.8	0.7199	-5.7001	-3.34	10.23	0.960	-16.08
16 AUG 1992	8850.50	10 51	4.9	8 51	41.5	0.7204	-6.1061	-3.33	10.33	0.954	-17.42
21 AUG 1992	8855.50	11 13	51.9	6 26	57.6	0.7210	-6.4961	-3.33	10.45	0.946	-18.75
26 AUG 1992	8860.50	11 36	24.4	3 55	50.1	0.7216	-6.8799	-3.32	10.58	0.939	-20.08
31 AUG 1992	8865.50	11 58	47.2	1 22	49.4	0.7223	-7.2566	-3.32	10.72	0.930	-21.36
5 SEP 1992	8870.50	12 21	5.3	-1 11	-34.4	0.7230	-7.6125	-3.32	10.87	0.922	-22.65
10 SEP 1992	8875.50	12 43	23.8	-3 45	-50.8	0.7236	-7.9426	-3.32	11.03	0.913	-23.92
15 SEP 1992	8880.50	13 5	48.0	-6 18	-29.9	0.7243	-8.2492	-3.33	11.20	0.903	-25.18
20 SEP 1992	8885.50	13 28	23.3	-8 48	-3.6	0.7250	-8.5408	-3.34	11.39	0.894	-26.42
25 SEP 1992	8890.50	13 51	14.8	-11 13	-0.6	0.7256	-8.8297	-3.34	11.58	0.884	-27.65
30 SEP 1992	8895.50	14 14	26.9	-13 31	-46.6	0.7262	-9.1139	-3.35	11.79	0.873	-28.85
5 OCT 1992	8900.50	14 38	3.3	-15 42	-45.4	0.7267	-9.3822	-3.36	12.02	0.862	-30.04
10 OCT 1992	8905.50	15 2	6.5	-17 44	-19.7	0.7272	-9.6302	-3.38	12.26	0.851	-31.21
15 OCT 1992	8910.50	15 26	38.5	-19 34	-54.1	0.7275	-9.8585	-3.39	12.52	0.840	-32.35
20 OCT 1992	8915.50	15 51	39.9	-21 12	-56.4	0.7278	-10.0775	-3.41	12.80	0.828	-33.48
25 OCT 1992	8920.50	16 17	10.0	-22 36	-57.5	0.7281	-10.2997	-3.43	13.09	0.816	-34.58
30 OCT 1992	8925.50	16 43	5.7	-23 45	-35.4	0.7282	-10.5215	-3.45	13.41	0.803	-35.66
4 NOV 1992	8930.50	17 9	22.1	-24 37	-38.7	0.7282	-10.7336	-3.47	13.74	0.790	-36.71
9 NOV 1992	8935.50	17 35	52.4	-25 12	-11.0	0.7281	-10.9300	-3.50	14.11	0.777	-37.74
14 NOV 1992	8940.50	18 2	28.9	-25 28	-34.8	0.7280	-11.1097	-3.52	14.49	0.763	-38.74
19 NOV 1992	8945.50	18 29	3.2	-25 26	-33.3	0.7277	-11.2846	-3.55	14.91	0.749	-39.70
24 NOV 1992	8950.50	18 55	26.7	-25 -6	-9.7	0.7274	-11.4650	-3.58	15.36	0.734	-40.63
29 NOV 1992	8955.50	19 21	30.6	-24 27	-49.8	0.7270	-11.6466	-3.61	15.85	0.719	-41.52
4 DEC 1992	8960.50	19 47	6.3	-23 32	-20.2	0.7265	-11.8203	-3.65	16.37	0.703	-42.38
9 DEC 1992	8965.50	20 12	7.0	-22 20	-45.2	0.7260	-11.9775	-3.69	16.94	0.686	-43.18
14 DEC 1992	8970.50	20 36	27.3	-20 54	-23.0	0.7254	-12.1168	-3.72	17.56	0.668	-43.94
19 DEC 1992	8975.50	21 0	3.6	-19 14	-40.9	0.7247	-12.2499	-3.76	18.23	0.650	-44.63
24 DEC 1992	8980.50	21 22	54.0	-17 23	-12.5	0.7241	-12.3841	-3.81	18.97	0.631	-45.26
29 DEC 1992	8985.50	21 44	57.0	-15 21	-38.4	0.7234	-12.5141	-3.85	19.77	0.611	-45.82

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1993	8990.50	22 6 11.4	-13-11-42.8	0.8102	0.7227	-12.6296	-3.90	20.66	0.590		-46.29
8 JAN 1993	8995.50	22 26 36.7	-10-55-10.2	0.7736	0.7220	-12.7181	-3.94	21.64	0.588		-46.67
13 JAN 1993	9000.50	22 46 12.5	-8-33-44.0	0.7368	0.7214	-12.7770	-3.99	22.72	0.545		-46.93
18 JAN 1993	9005.50	23 4 58.7	-6 -9 -3.1	0.6998	0.7208	-12.8154	-4.04	23.92	0.520		-47.06
23 JAN 1993	9010.50	23 22 54.2	-3-42-46.0	0.6628	0.7202	-12.8349	-4.09	25.26	0.494		-47.03
28 JAN 1993	9015.50	23 39 56.0	-1-16-35.9	0.6257	0.7197	-12.8258	-4.14	26.75	0.466		-48.82
2 FEB 1993	9020.50	23 55 58.7	1 7 40.0	0.5887	0.7193	-12.7690	-4.19	28.43	0.437		-48.39
7 FEB 1993	9025.50	0 10 54.7	3 28 9.6	0.5520	0.7190	-12.6421	-4.23	30.32	0.405		-46.70
12 FEB 1993	9030.50	0 24 33.7	5 42 55.9	0.5158	0.7187	-12.4326	-4.28	32.45	0.371		-44.66
17 FEB 1993	9035.50	0 36 42.3	7 49 54.5	0.4803	0.7185	-12.1335	-4.31	34.85	0.334		-43.29
22 FEB 1993	9040.50	0 47 2.9	9 46 40.1	0.4458	0.7184	-11.7228	-4.33	37.54	0.294		-41.44
27 FEB 1993	9045.50	0 55 11.8	11 30 11.1	0.4128	0.7185	-11.1602	-4.33	40.55	0.252		-39.04
4 MAR 1993	9050.50	1 0 41.1	12 56 39.1	0.3816	0.7186	-10.3868	-4.30	43.87	0.207		-35.97
9 MAR 1993	9055.50	1 3 1.7	14 1 19.5	0.3530	0.7188	-9.3363	-4.23	47.41	0.161		-32.12
14 MAR 1993	9060.50	1 1 50.8	14 38 41.8	0.3280	0.7191	-7.9690	-4.10	51.03	0.114		-27.41
19 MAR 1993	9065.50	0 57 2.6	14 43 13.1	0.3074	0.7195	-6.2236	-3.90	54.45	0.072		-21.87
24 MAR 1993	9070.50	0 48 59.8	14 10 51.5	0.2924	0.7199	-4.1242	-3.62	57.25	0.037		-15.72
29 MAR 1993	9075.50	0 38 43.5	13 1 52.8	0.2839	0.7205	-1.7156	-3.30	58.96	0.015		-9.94
3 APR 1993	9080.50	0 27 49.6	11 23 28.9	0.2827	0.7211	0.8673	-3.18	59.22	0.010		8.05
8 APR 1993	9085.50	0 18 7.8	9 29 41.2	0.2889	0.7217	3.4201	-3.42	57.94	0.022		12.33
13 APR 1993	9090.50	0 11 9.0	7 37 17.4	0.3022	0.7224	5.7354	-3.72	55.39	0.051		18.42
18 APR 1993	9095.50	0 7 43.7	6 0 15.5	0.3217	0.7230	7.6953	-3.95	52.04	0.089		24.25
23 APR 1993	9100.50	0 8 1.9	4 46 48.7	0.3463	0.7237	9.2836	-4.10	48.34	0.133		29.31
28 APR 1993	9105.50	0 11 47.8	3 59 51.6	0.3750	0.7244	10.5404	-4.18	44.64	0.179		33.51
3 MAY 1993	9110.50	0 18 34.7	3 38 53.5	0.4069	0.7251	11.5222	-4.22	41.14	0.225		36.89
8 MAY 1993	9115.50	0 27 54.4	3 41 41.0	0.4413	0.7257	12.2723	-4.23	37.93	0.268		39.56
13 MAY 1993	9120.50	0 39 20.5	4 5 12.5	0.4776	0.7263	12.8248	-4.21	35.05	0.309		41.61
18 MAY 1993	9125.50	0 52 30.0	4 46 9.5	0.5152	0.7268	13.2225	-4.17	32.49	0.347		43.15
23 MAY 1993	9130.50	1 7 3.8	5 41 18.7	0.5538	0.7272	13.5070	-4.13	30.22	0.382		44.27
28 MAY 1993	9135.50	1 22 47.5	6 47 41.5	0.5931	0.7276	13.7095	-4.09	28.22	0.416		45.04
2 JUN 1993	9140.50	1 39 31.0	8 2 39.6	0.6329	0.7279	13.8477	-4.04	26.45	0.447		45.53
7 JUN 1993	9145.50	1 57 7.6	9 23 51.0	0.6730	0.7281	13.9213	-3.98	24.87	0.476		45.78
12 JUN 1993	9150.50	2 15 32.4	10 49 1.0	0.7133	0.7282	13.9304	-3.93	23.47	0.504		45.81
17 JUN 1993	9155.50	2 34 42.0	12 16 0.7	0.7535	0.7283	13.8881	-3.88	22.22	0.530		45.68
22 JUN 1993	9160.50	2 54 33.3	13 42 47.7	0.7935	0.7282	13.8097	-3.84	21.10	0.555		45.41
27 JUN 1993	9165.50	3 15 4.4	15 7 26.6	0.8332	0.7280	13.7081	-3.79	20.09	0.579		45.01
2 JUL 1993	9170.50	3 36 14.3	16 28 10.4	0.8726	0.7277	13.5860	-3.75	19.18	0.601		44.50
7 JUL 1993	9175.50	3 58 2.3	17 43 17.8	0.9116	0.7274	13.4327	-3.71	18.36	0.623		43.90
12 JUL 1993	9180.50	4 20 27.3	18 51 9.6	0.9501	0.7270	13.2435	-3.67	17.62	0.644		43.22
17 JUL 1993	9185.50	4 43 27.1	19 50 11.5	0.9881	0.7265	13.0256	-3.63	16.94	0.664		42.47

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1993	9190.50	5 6	58.7	20 38 56.8	1.0254	0.7259	12.7895	-3.60	16.32	0.683	41.68
27 JUL 1993	9195.50	5 30	58.2	21 16 7.7	1.0619	0.7253	12.5458	-3.57	15.76	0.702	40.79
1 AUG 1993	9200.50	5 55	21.5	21 40 39.0	1.0978	0.7247	12.2937	-3.54	15.25	0.720	39.88
6 AUG 1993	9205.50	6 20	4.0	21 51 36.9	1.1329	0.7240	12.0205	-3.52	14.77	0.737	38.92
11 AUG 1993	9210.50	6 45	0.3	21 48 20.5	1.1672	0.7233	11.7224	-3.49	14.34	0.754	37.92
16 AUG 1993	9215.50	7 10	4.4	21 30 25.2	1.2008	0.7228	11.4037	-3.47	13.94	0.770	36.89
21 AUG 1993	9220.50	7 35	9.9	20 57 43.7	1.2331	0.7220	11.0742	-3.45	13.57	0.786	35.83
26 AUG 1993	9225.50	8 0	11.2	20 10 25.2	1.2646	0.7213	10.7454	-3.44	13.24	0.801	34.75
31 AUG 1993	9230.50	8 25	3.5	19 8 54.2	1.2951	0.7207	10.4139	-3.42	12.92	0.815	33.64
5 SEP 1993	9235.50	8 49	43.1	17 53 47.6	1.3247	0.7201	10.0882	-3.41	12.64	0.829	32.50
10 SEP 1993	9240.50	9 14	7.7	16 25 54.6	1.3532	0.7196	9.7048	-3.40	12.37	0.843	31.35
15 SEP 1993	9245.50	9 38	15.4	14 46 16.1	1.3807	0.7192	9.3261	-3.39	12.12	0.856	30.19
20 SEP 1993	9250.50	10 2	5.4	12 58 2.6	1.4071	0.7189	8.9427	-3.38	11.90	0.868	29.01
25 SEP 1993	9255.50	10 25	38.3	10 56 30.2	1.4324	0.7186	8.5668	-3.37	11.69	0.879	27.81
30 SEP 1993	9260.50	10 48	55.8	8 48 58.9	1.4566	0.7185	8.1928	-3.37	11.49	0.891	26.61
5 OCT 1993	9265.50	11 12	0.9	6 34 50.0	1.4797	0.7184	7.8121	-3.36	11.31	0.901	25.40
10 OCT 1993	9270.50	11 34	57.0	4 15 28.0	1.5017	0.7184	7.4202	-3.36	11.15	0.911	24.17
15 OCT 1993	9275.50	11 57	47.8	1 52 21.5	1.5225	0.7186	7.0176	-3.36	10.99	0.920	22.95
20 OCT 1993	9280.50	12 20	37.5	0 32 58.6	1.5422	0.7188	6.6171	-3.36	10.85	0.929	21.72
25 OCT 1993	9285.50	12 43	30.3	-2 59 -0.3	1.5608	0.7191	6.2293	-3.36	10.72	0.938	20.48
30 OCT 1993	9290.50	13 6	31.0	-5 24 -11.0	1.5782	0.7195	5.8490	-3.36	10.61	0.945	19.25
4 NOV 1993	9295.50	13 29	44.6	-7 46 58.1	1.5946	0.7200	5.4687	-3.36	10.50	0.952	18.01
9 NOV 1993	9300.50	13 53	15.7	-10 -6 45.9	1.6098	0.7205	5.0819	-3.36	10.40	0.959	16.77
14 NOV 1993	9305.50	14 17	8.4	-12 18 55.4	1.6239	0.7211	4.6885	-3.37	10.31	0.965	15.53
19 NOV 1993	9310.50	14 41	26.1	-14 24 45.7	1.6369	0.7217	4.3022	-3.37	10.23	0.971	14.30
24 NOV 1993	9315.50	15 6	11.3	-16 21 35.5	1.6488	0.7224	3.9314	-3.38	10.15	0.976	13.07
29 NOV 1993	9320.50	15 31	25.9	-18 -7 45.7	1.6596	0.7231	3.5714	-3.39	10.09	0.980	11.84
4 DEC 1993	9325.50	15 57	10.5	-19 41 40.7	1.6694	0.7238	3.2153	-3.40	10.03	0.984	10.61
9 DEC 1993	9330.50	16 23	24.3	-21 -1 48.4	1.6782	0.7244	2.8636	-3.41	9.97	0.988	9.39
14 DEC 1993	9335.50	16 50	4.6	-22 -6 44.4	1.6859	0.7251	2.4862	-3.42	9.93	0.991	8.17
19 DEC 1993	9340.50	17 17	6.8	-22 55 16.4	1.6925	0.7257	2.1270	-3.43	9.89	0.993	6.96
24 DEC 1993	9345.50	17 44	24.9	-23 26 28.9	1.6982	0.7263	1.7813	-3.44	9.86	0.995	5.76
29 DEC 1993	9350.50	18 11	52.1	-23 39 37.5	1.7028	0.7268	1.4460	-3.46	9.83	0.997	4.57

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	18 39	20.8	-23-34-30.1	1.7085	0.7273	1.1135	-3.47	9.81	0.998	3.39
8 JAN 1994	9360.50	19 6	43.5	-22-11-6.6	1.7092	0.7276	0.7711	-3.49	9.79	0.999	2.26
13 JAN 1994	9365.50	19 33	52.6	-22-29-51.0	1.7110	0.7279	0.4205	-3.50	9.78	1.000	1.26
18 JAN 1994	9370.50	20 0	41.3	-21-31-27.2	1.7117	0.7281	0.0734	-3.50	9.78	1.000	-0.98
23 JAN 1994	9375.50	20 27	4.4	-20-16-55.9	1.7114	0.7283	-0.2662	-3.49	9.78	1.000	-1.79
28 JAN 1994	9380.50	20 52	58.3	-18-47-31.6	1.7101	0.7283	-0.5994	-3.47	9.79	0.999	-2.88
2 FEB 1994	9385.50	21 18	21.4	-17-4-37.6	1.7079	0.7282	-0.9358	-3.45	9.80	0.998	-4.04
7 FEB 1994	9390.50	21 43	13.6	-15-9-43.4	1.7047	0.7280	-1.2888	-3.44	9.82	0.998	-5.21
12 FEB 1994	9395.50	22 7	36.0	-13-4-24.4	1.7005	0.7277	-1.6552	-3.42	9.84	0.994	-6.39
17 FEB 1994	9400.50	22 31	30.8	-10-50-18.3	1.6952	0.7274	-2.0254	-3.41	9.87	0.992	-7.58
22 FEB 1994	9405.50	22 55	1.1	-8-29-2.8	1.6888	0.7270	-2.3948	-3.40	9.91	0.989	-8.77
27 FEB 1994	9410.50	23 18	11.0	-6-2-14.2	1.6813	0.7265	-2.7621	-3.38	9.96	0.988	-9.97
4 MAR 1994	9415.50	23 41	6.6	-3-31-26.0	1.6728	0.7269	-3.1388	-3.37	10.01	0.982	-11.17
9 MAR 1994	9420.50	0 3	50.0	0-58-10.3	1.6632	0.7253	-3.5364	-3.37	10.06	0.978	-12.37
14 MAR 1994	9425.50	0 26	29.5	1 35 59.7	1.6524	0.7247	-3.9503	-3.38	10.13	0.973	-13.58
19 MAR 1994	9430.50	0 49	9.1	4 9 30.9	1.6404	0.7240	-4.3722	-3.35	10.20	0.968	-14.80
24 MAR 1994	9435.50	1 11	53.9	6 40 50.5	1.6271	0.7233	-4.7944	-3.35	10.29	0.962	-16.02
29 MAR 1994	9440.50	1 34	49.0	9 8 26.3	1.6127	0.7228	-5.2138	-3.34	10.38	0.958	-17.24
3 APR 1994	9445.50	1 57	59.3	11 30 47.5	1.5970	0.7219	-5.6422	-3.34	10.48	0.949	-18.47
8 APR 1994	9450.50	2 21	29.1	13 46 21.6	1.5801	0.7213	-6.0876	-3.34	10.59	0.942	-19.70
13 APR 1994	9455.50	2 45	21.9	15 53 34.5	1.5618	0.7207	-6.5449	-3.34	10.72	0.934	-20.93
18 APR 1994	9460.50	3 9	40.0	17 50 52.0	1.5423	0.7201	-7.0059	-3.34	10.85	0.925	-22.17
23 APR 1994	9465.50	3 34	24.4	19 36 41.9	1.5214	0.7196	-7.4586	-3.34	11.00	0.916	-23.40
28 APR 1994	9470.50	3 59	35.1	21 9 36.3	1.4992	0.7192	-7.8996	-3.35	11.17	0.906	-24.63
3 MAY 1994	9475.50	4 25	10.7	22 28 14.8	1.4758	0.7189	-8.3399	-3.35	11.34	0.896	-25.86
8 MAY 1994	9480.50	4 51	8.2	23 31 24.7	1.4510	0.7186	-8.7846	-3.36	11.54	0.884	-27.09
13 MAY 1994	9485.50	5 17	22.7	24 18 5.0	1.4250	0.7185	-9.2297	-3.36	11.75	0.873	-28.30
18 MAY 1994	9490.50	5 43	47.7	24 47 30.0	1.3977	0.7184	-9.6664	-3.37	11.98	0.860	-29.51
23 MAY 1994	9495.50	6 10	15.6	24 59 11.9	1.3692	0.7184	-10.0804	-3.39	12.22	0.847	-30.71
28 MAY 1994	9500.50	6 36	38.3	24 53 2.8	1.3395	0.7186	-10.4699	-3.40	12.50	0.833	-31.90
2 JUN 1994	9505.50	7 2	48.2	24 29 14.6	1.3088	0.7188	-10.8448	-3.41	12.79	0.819	-33.06
7 JUN 1994	9510.50	7 28	38.0	23 48 17.0	1.2769	0.7191	-11.2099	-3.43	13.11	0.804	-34.21
12 JUN 1994	9515.50	7 54	1.1	22 50 57.7	1.2440	0.7195	-11.5844	-3.45	13.46	0.789	-35.34
17 JUN 1994	9520.50	8 18	52.0	21 38 20.0	1.2101	0.7200	-11.8988	-3.47	13.83	0.773	-36.44
22 JUN 1994	9525.50	8 43	6.5	20 11 38.0	1.1753	0.7205	-12.1992	-3.49	14.24	0.756	-37.51
27 JUN 1994	9530.50	9 6	42.3	18 32 14.0	1.1397	0.7211	-12.4864	-3.52	14.69	0.739	-38.55
2 JUL 1994	9535.50	9 29	38.6	16 41 33.3	1.1034	0.7218	-12.7100	-3.54	15.17	0.721	-39.54
7 JUL 1994	9540.50	9 51	56.2	14 41 2.5	1.0663	0.7224	-12.9366	-3.57	15.70	0.703	-40.50
12 JUL 1994	9545.50	10 13	35.9	12 32 10.9	1.0287	0.7231	-13.1481	-3.60	16.27	0.684	-41.41
17 JUL 1994	9550.50	10 34	39.4	10 16 28.2	0.9904	0.7238	-13.3343	-3.64	16.90	0.665	-42.26

GEOCENTRIC EPHEMERIS FOR VENUS

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22 JUL 1994	9555.50	10 55 8.5	7 55 22.6	0.9517	0.7245	-13.4827	-3.67	17.59	0.644	-43.05
27 JUL 1994	9560.50	11 15 5.5	5 30 19.0	0.9126	0.7251	-13.5959	-3.71	18.34	0.624	-43.78
1 AUG 1994	9565.50	11 34 33.0	3 2 36.5	0.8732	0.7267	-13.6823	-3.75	19.17	0.602	-44.42
6 AUG 1994	9570.50	11 53 33.3	0 33 32.4	0.8336	0.7268	-13.7501	-3.80	20.08	0.580	-44.98
11 AUG 1994	9575.50	12 12 8.1	-1 55-35.2	0.7938	0.7268	-13.8006	-3.84	21.09	0.557	-45.44
16 AUG 1994	9580.50	12 30 17.4	-4 23-27.5	0.7539	0.7273	-13.8208	-3.89	22.20	0.533	-45.78
21 AUG 1994	9585.50	12 48 0.5	-6 48-45.6	0.7140	0.7277	-13.7972	-3.94	23.44	0.508	-45.99
26 AUG 1994	9590.50	13 5 15.4	-9 10-13.1	0.6743	0.7279	-13.7300	-3.99	24.83	0.481	-46.04
31 AUG 1994	9595.50	13 21 59.1	-11 28-37.9	0.6348	0.7281	-13.6230	-4.05	26.37	0.453	-46.90
5 SEP 1994	9600.50	13 38 6.5	-13 36-45.8	0.5956	0.7282	-13.4796	-4.10	28.10	0.424	-46.55
10 SEP 1994	9605.50	13 53 28.7	-15 39-17.9	0.5569	0.7283	-13.2917	-4.15	30.05	0.393	-44.94
15 SEP 1994	9610.50	14 7 53.2	-17 32-48.3	0.5189	0.7282	-13.0323	-4.20	32.28	0.360	-44.03
20 SEP 1994	9615.50	14 21 2.7	-19 15-41.6	0.4818	0.7280	-12.6750	-4.24	34.74	0.324	-42.74
25 SEP 1994	9620.50	14 32 38.1	-20 46-14.0	0.4458	0.7277	-12.1998	-4.27	37.55	0.286	-40.99
30 SEP 1994	9625.50	14 42 8.1	-22 2-24.3	0.4114	0.7274	-11.5837	-4.28	40.88	0.245	-38.69
5 OCT 1994	9630.50	14 49 8.4	-23 1-37.2	0.3791	0.7269	-10.7969	-4.27	44.16	0.202	-35.73
10 OCT 1994	9635.50	14 53 4.0	-23 40-27.6	0.3493	0.7264	-9.7837	-4.21	47.92	0.158	-32.00
15 OCT 1994	9640.50	14 53 23.7	-23 54-30.0	0.3229	0.7259	-8.4688	-4.10	51.84	0.112	-27.39
20 OCT 1994	9645.50	14 49 51.4	-23 38-47.1	0.3007	0.7253	-6.7956	-3.92	55.66	0.070	-21.82
25 OCT 1994	9650.50	14 42 42.5	-22 49-28.5	0.2840	0.7246	-4.7546	-3.64	58.94	0.035	-15.43
30 OCT 1994	9655.50	14 32 55.6	-21 26-37.4	0.2736	0.7239	-2.4071	-3.29	61.18	0.011	-8.79
4 NOV 1994	9660.50	14 22 8.0	-19 36-57.8	0.2702	0.7233	0.1074	-3.08	61.94	0.004	5.44
9 NOV 1994	9665.50	14 12 12.5	-17 34 -5.4	0.2742	0.7226	2.6104	-3.39	61.05	0.016	10.39
14 NOV 1994	9670.50	14 4 46.0	-15 34-45.4	0.2851	0.7219	4.9254	-3.75	58.70	0.043	17.18
19 NOV 1994	9675.50	14 0 48.7	-13 53-28.9	0.3023	0.7213	6.9176	-4.02	55.37	0.081	23.53
24 NOV 1994	9680.50	14 0 41.1	-12 38-56.5	0.3247	0.7207	8.5333	-4.20	51.55	0.126	28.99
29 NOV 1994	9685.50	14 4 13.3	-11 53-40.2	0.3513	0.7201	9.7899	-4.30	47.65	0.173	33.50
4 DEC 1994	9690.50	14 11 0.2	-11 35-56.2	0.3810	0.7196	10.7475	-4.35	43.94	0.219	37.13
9 DEC 1994	9695.50	14 20 32.6	-11 41-55.5	0.4131	0.7192	11.4802	-4.37	40.52	0.263	39.99
14 DEC 1994	9700.50	14 32 24.7	-12 -7-14.0	0.4471	0.7189	12.0402	-4.35	37.44	0.304	42.20
19 DEC 1994	9705.50	14 46 15.5	-12 47-31.3	0.4825	0.7187	12.4559	-4.33	34.69	0.342	43.88
24 DEC 1994	9710.50	15 1 47.9	-13 38-42.0	0.5189	0.7185	12.7503	-4.29	32.28	0.378	45.11
29 DEC 1994	9715.50	15 18 48.0	-14 36-58.4	0.5561	0.7184	12.9460	-4.24	30.10	0.411	45.97

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1995	9720.50	15 37	4.3	-15-38-53.8	0.5936	0.7185	13.0712	-4.19	28.20	0.442	48.54
8 JAN 1995	9725.50	15 56	27.4	-16-41-24.3	0.6315	0.7186	13.1522	-4.14	26.51	0.471	46.85
13 JAN 1995	9730.50	16 16	50.4	-17-41-47.8	0.6696	0.7189	13.1970	-4.09	25.00	0.499	46.96
18 JAN 1995	9735.50	16 38	7.7	-18-37-38.8	0.7077	0.7192	13.2027	-4.03	23.65	0.525	46.90
23 JAN 1995	9740.50	17 0	13.9	-19-26-45.4	0.7458	0.7196	13.1682	-3.98	22.44	0.549	46.68
28 JAN 1995	9745.50	17 23	2.9	-20-7-9.1	0.7837	0.7200	13.0976	-3.93	21.36	0.572	46.34
2 FEB 1995	9750.50	17 46	27.9	-20-37-8.8	0.8214	0.7208	13.0061	-3.88	20.38	0.594	45.90
7 FEB 1995	9755.50	18 10	21.9	-20-55-21.4	0.8588	0.7212	12.9077	-3.83	19.49	0.615	45.37
12 FEB 1995	9760.50	18 34	38.2	-21-0-43.2	0.8959	0.7218	12.8009	-3.79	18.68	0.635	44.75
17 FEB 1995	9765.50	18 59	9.9	-20-52-28.7	0.9327	0.7225	12.6784	-3.75	17.95	0.654	44.07
22 FEB 1995	9770.50	19 23	50.6	-20-30-10.1	0.9691	0.7231	12.5339	-3.70	17.27	0.673	43.33
27 FEB 1995	9775.50	19 48	33.2	-19-53-40.2	1.0051	0.7238	12.3677	-3.67	16.65	0.690	42.53
4 MAR 1995	9780.50	20 13	11.2	-19-3-11.6	1.0406	0.7245	12.1934	-3.63	16.09	0.707	41.69
9 MAR 1995	9785.50	20 37	39.2	-17-59-13.7	1.0755	0.7251	12.0204	-3.59	15.58	0.723	40.80
14 MAR 1995	9790.50	21 1	53.3	-16-42-29.7	1.1100	0.7258	11.8448	-3.58	15.08	0.739	39.88
19 MAR 1995	9795.50	21 25	51.0	-15-13-53.0	1.1439	0.7263	11.6586	-3.53	14.63	0.754	38.92
24 MAR 1995	9800.50	21 49	31.1	-13-34-25.4	1.1773	0.7268	11.4525	-3.50	14.22	0.769	37.92
29 MAR 1995	9805.50	22 12	53.3	-11-45-18.7	1.2100	0.7273	11.2260	-3.47	13.83	0.783	36.90
3 APR 1995	9810.50	22 35	57.9	-9-47-50.2	1.2421	0.7276	10.9921	-3.45	13.48	0.797	35.86
8 APR 1995	9815.50	22 58	46.5	-7-43-20.2	1.2735	0.7279	10.7573	-3.42	13.14	0.810	34.78
13 APR 1995	9820.50	23 21	21.9	-5-33-9.4	1.3043	0.7281	10.5180	-3.40	12.83	0.823	33.68
18 APR 1995	9825.50	23 43	47.4	-3-18-37.7	1.3343	0.7282	10.2861	-3.38	12.55	0.835	32.58
23 APR 1995	9830.50	0 6	7.1	-1-1-5.7	1.3635	0.7282	9.9899	-3.37	12.28	0.847	31.42
28 APR 1995	9835.50	0 28	25.0	1 18 2.8	1.3919	0.7281	9.6904	-3.35	12.03	0.859	30.25
3 MAY 1995	9840.50	0 50	45.2	3 37 23.2	1.4195	0.7279	9.3800	-3.34	11.79	0.870	29.07
8 MAY 1995	9845.50	1 13	11.9	5 55 30.6	1.4461	0.7277	9.0638	-3.33	11.57	0.881	27.87
13 MAY 1995	9850.50	1 35	49.4	8 11 0.2	1.4718	0.7273	8.7408	-3.32	11.37	0.891	26.65
18 MAY 1995	9855.50	1 58	42.3	10 22 28.5	1.4966	0.7269	8.4024	-3.31	11.18	0.901	25.41
23 MAY 1995	9860.50	2 21	54.6	12 28 29.4	1.5203	0.7264	8.0365	-3.31	11.01	0.911	24.16
28 MAY 1995	9865.50	2 45	29.7	14 27 33.9	1.5430	0.7258	7.6468	-3.30	10.85	0.920	22.89
2 JUN 1995	9870.50	3 9	30.0	16 18 12.8	1.5645	0.7252	7.2441	-3.30	10.70	0.929	21.61
7 JUN 1995	9875.50	3 33	57.0	17 58 57.1	1.5848	0.7246	6.8348	-3.30	10.56	0.937	20.32
12 JUN 1995	9880.50	3 58	51.4	19 28 20.9	1.6039	0.7239	6.4211	-3.31	10.44	0.945	19.01
17 JUN 1995	9885.50	4 24	12.9	20 45 3.5	1.6219	0.7232	5.9935	-3.31	10.32	0.952	17.69
22 JUN 1995	9890.50	4 49	59.7	21 47 48.3	1.6385	0.7225	5.5414	-3.32	10.22	0.959	16.36
27 JUN 1995	9895.50	5 16	8.5	22 35 28.1	1.6539	0.7219	5.0703	-3.33	10.12	0.965	15.03
2 JUL 1995	9900.50	5 42	34.2	23 7 7.2	1.6678	0.7212	4.5904	-3.34	10.04	0.971	13.68
7 JUL 1995	9905.50	6 9	10.7	23 22 5.0	1.6804	0.7206	4.1099	-3.35	9.96	0.977	12.34
12 JUL 1995	9910.50	6 35	51.7	23 19 58.2	1.6915	0.7201	3.6333	-3.36	9.90	0.982	10.98
17 JUL 1995	9915.50	7 2	30.3	23 0 41.7	1.7013	0.7196	3.1503	-3.38	9.84	0.986	9.63

GEOCENTRIC EPHEMERIS FOR VENUS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	7 29 0.1	22 24 27.2	1.7097	0.7192	2.6526	-3.40	9.79	0.990	8.27
27 JUL 1995	9925.50	7 55 15.2	21 31 45.3	1.7167	0.7189	2.1460	-3.41	9.75	0.993	6.92
1 AUG 1995	9930.50	8 21 10.2	20 23 23.0	1.7221	0.7187	1.6389	-3.43	9.72	0.997	5.58
6 AUG 1995	9935.50	8 46 41.2	19 0 20.8	1.7261	0.7185	1.1425	-3.45	9.70	0.999	4.26
11 AUG 1995	9940.50	9 11 46.1	17 23 50.4	1.7287	0.7185	0.6611	-3.47	9.68	0.999	2.99
16 AUG 1995	9945.50	9 36 24.1	15 35 10.0	1.7300	0.7185	0.1834	-3.49	9.68	1.000	-1.33
21 AUG 1995	9950.50	10 0 36.1	13 35 42.7	1.7298	0.7186	-0.2969	-3.50	9.68	0.999	-1.95
26 AUG 1995	9955.50	10 24 23.8	11 26 56.9	1.7282	0.7189	-0.7768	-3.49	9.69	0.999	-3.08
31 AUG 1995	9960.50	10 47 49.9	9 10 23.7	1.7253	0.7192	-1.2487	-3.47	9.70	0.999	-4.34
5 SEP 1995	9965.50	11 10 57.7	6 47 34.7	1.7210	0.7196	-1.7001	-3.45	9.73	0.997	-5.63
10 SEP 1995	9970.50	11 33 51.5	4 20 1.5	1.7155	0.7201	-2.1291	-3.44	9.76	0.995	-6.94
15 SEP 1995	9975.50	11 56 36.2	1 49 13.7	1.7088	0.7206	-2.5475	-3.42	9.80	0.993	-8.24
20 SEP 1995	9980.50	12 19 17.2	0 43 19.2	1.7008	0.7212	-2.9611	-3.40	9.84	0.990	-9.54
25 SEP 1995	9985.50	12 41 59.7	-3 16 5.3	1.6917	0.7219	-3.3708	-3.39	9.89	0.987	-10.83
30 SEP 1995	9990.50	13 4 48.7	-5 47 31.2	1.6813	0.7225	-3.7701	-3.38	9.96	0.983	-12.12
5 OCT 1995	9995.50	13 27 49.4	-8 16 2.4	1.6699	0.7232	-4.1456	-3.37	10.02	0.978	-13.40
10 OCT 1995	10000.50	13 51 6.5	-10 40 3.2	1.6574	0.7239	-4.4986	-3.36	10.10	0.974	-14.67
15 OCT 1995	10005.50	14 14 44.9	-12 57 58.5	1.6439	0.7245	-4.8401	-3.35	10.18	0.969	-15.92
20 OCT 1995	10010.50	14 38 48.8	-15 8 10.9	1.6295	0.7252	-5.1772	-3.34	10.27	0.963	-17.17
25 OCT 1995	10015.50	15 3 21.2	-17 9 0.4	1.6140	0.7258	-5.5138	-3.34	10.37	0.957	-18.40
30 OCT 1995	10020.50	15 28 24.0	-18 58 47.2	1.5976	0.7264	-5.8425	-3.33	10.48	0.951	-19.62
4 NOV 1995	10025.50	15 53 57.4	-20 35 53.2	1.5803	0.7269	-6.1608	-3.33	10.59	0.944	-20.83
9 NOV 1995	10030.50	16 20 0.5	-21 58 45.9	1.5621	0.7273	-6.4418	-3.33	10.72	0.937	-22.03
14 NOV 1995	10035.50	16 46 30.8	-23 6 1.7	1.5431	0.7276	-6.7246	-3.33	10.85	0.930	-23.21
19 NOV 1995	10040.50	17 13 23.8	-23 58 27.6	1.5233	0.7279	-7.0078	-3.33	10.99	0.922	-24.38
24 NOV 1995	10045.50	17 40 33.8	-24 29 4.7	1.5026	0.7281	-7.2970	-3.34	11.14	0.914	-25.54
29 NOV 1995	10050.50	18 7 52.8	-24 43 13.0	1.4812	0.7282	-7.5828	-3.34	11.30	0.908	-26.69
4 DEC 1995	10055.50	18 35 12.3	-24 38 33.5	1.4589	0.7282	-7.8539	-3.35	11.47	0.897	-27.82
9 DEC 1995	10060.50	19 2 23.8	-24 15 9.5	1.4358	0.7281	-8.1136	-3.36	11.66	0.888	-28.93
14 DEC 1995	10065.50	19 29 19.4	-23 33 26.3	1.4120	0.7279	-8.3689	-3.37	11.85	0.878	-30.03
19 DEC 1995	10070.50	19 55 52.2	-22 34 7.9	1.3875	0.7276	-8.6304	-3.38	12.06	0.868	-31.12
24 DEC 1995	10075.50	20 21 56.5	-21 18 16.7	1.3622	0.7273	-8.9027	-3.40	12.29	0.858	-32.19
29 DEC 1995	10080.50	20 47 28.0	-19 47 10.1	1.3360	0.7268	-9.1749	-3.41	12.53	0.847	

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1986	6435.50	14 43	29.9	-14-47 -9.6	1.8604	1.6349	-15.8606	1.59	5.03	0.925	61.34
10 JAN 1986	6440.50	14 55	30.7	-15-42-27.4	1.8142	1.6311	-16.1240	1.54	5.16	0.921	63.39
15 JAN 1986	6445.50	15 7	34.4	-16-35 -3.1	1.7673	1.6270	-16.3484	1.49	5.30	0.918	65.46
20 JAN 1986	6450.50	15 19	40.8	-17-24-48.2	1.7198	1.6227	-16.5323	1.44	5.44	0.914	67.54
25 JAN 1986	6455.50	15 31	49.6	-18-11-36.7	1.6718	1.6182	-16.6876	1.38	5.60	0.911	69.63
30 JAN 1986	6460.50	15 44	0.6	-18-55-22.9	1.6234	1.6135	-16.8240	1.32	5.77	0.907	71.73
4 FEB 1986	6465.50	15 56	13.0	-19-36 -0.8	1.5747	1.6087	-16.9410	1.25	5.95	0.904	73.85
9 FEB 1986	6470.50	16 8	25.8	-20-13-25.6	1.5256	1.6036	-17.0283	1.19	6.14	0.901	75.98
14 FEB 1986	6475.50	16 20	37.6	-20-47-33.1	1.4764	1.5985	-17.0686	1.12	6.34	0.898	78.12
19 FEB 1986	6480.50	16 32	47.5	-21-18-22.2	1.4271	1.5931	-17.0717	1.04	6.58	0.896	80.29
24 FEB 1986	6485.50	16 44	54.7	-21-45-54.0	1.3778	1.5876	-17.0487	0.97	6.79	0.893	82.47
1 MAR 1986	6490.50	16 56	57.8	-22-10 -9.9	1.3286	1.5819	-17.0080	0.89	7.05	0.891	84.67
6 MAR 1986	6495.50	17 8	55.6	-22-31-13.1	1.2796	1.5762	-16.9451	0.80	7.32	0.889	86.90
11 MAR 1986	6500.50	17 20	45.8	-22-49 -8.6	1.2308	1.5703	-16.8462	0.71	7.61	0.887	89.15
16 MAR 1986	6505.50	17 32	26.4	-23 -4 -3.5	1.1823	1.5642	-16.7044	0.62	7.92	0.886	91.44
21 MAR 1986	6510.50	17 43	55.8	-23-16 -8.2	1.1344	1.5581	-16.5269	0.53	8.25	0.885	93.77
26 MAR 1986	6515.50	17 55	12.2	-23-25-35.0	1.0869	1.5519	-16.3274	0.43	8.61	0.885	96.14
31 MAR 1986	6520.50	18 6	13.7	-23-32-37.6	1.0401	1.5456	-16.1109	0.32	9.00	0.885	98.55
5 APR 1986	6525.50	18 16	57.7	-23-37-33.3	0.9939	1.5392	-15.8673	0.21	9.42	0.885	101.03
10 APR 1986	6530.50	18 27	20.7	-23-46-41.6	0.9485	1.5328	-15.5830	0.10	9.87	0.886	103.57
15 APR 1986	6535.50	18 37	19.9	-23-42-25.0	0.9039	1.5263	-15.2545	-0.02	10.36	0.888	106.20
20 APR 1986	6540.50	18 46	52.6	-23-43 -8.8	0.8604	1.5198	-14.8906	-0.14	10.88	0.890	108.91
25 APR 1986	6545.50	18 55	55.8	-23-43-19.4	0.8180	1.5133	-14.5033	-0.27	11.45	0.893	111.71
30 APR 1986	6550.50	19 4	25.9	-23-43-27.0	0.7767	1.5067	-14.0903	-0.40	12.05	0.897	114.64
5 MAY 1986	6555.50	19 12	17.9	-23-44 -5.4	0.7368	1.5002	-13.6350	-0.54	12.71	0.902	117.70
10 MAY 1986	6560.50	19 19	26.7	-23-45-50.1	0.6980	1.4937	-13.1237	-0.68	13.41	0.907	120.92
15 MAY 1986	6565.50	19 25	47.3	-23-49-17.0	0.6609	1.4872	-12.5540	-0.83	14.17	0.914	124.31
20 MAY 1986	6570.50	19 31	14.9	-23-55 -0.7	0.6255	1.4808	-11.9338	-0.98	14.97	0.921	127.90
25 MAY 1986	6575.50	19 35	44.2	-24 -3-33.6	0.5920	1.4745	-11.2691	-1.14	15.81	0.929	131.70
30 MAY 1986	6580.50	19 39	9.1	-24-15-27.1	0.5605	1.4682	-10.5457	-1.30	16.70	0.938	135.74
4 JUN 1986	6585.50	19 41	22.4	-24-31 -6.3	0.5312	1.4620	-9.7414	-1.46	17.63	0.948	140.04
9 JUN 1986	6590.50	19 42	18.4	-24-50-42.1	0.5043	1.4560	-8.8459	-1.62	18.56	0.957	144.63
14 JUN 1986	6595.50	19 41	53.8	-25-14 -6.2	0.4802	1.4501	-7.8819	-1.78	19.50	0.967	149.50
19 JUN 1986	6600.50	19 40	8.3	-25-40-47.3	0.4590	1.4443	-6.8045	-1.93	20.40	0.977	154.63
24 JUN 1986	6605.50	19 37	4.2	-26 -9-53.0	0.4409	1.4387	-5.6816	-2.08	21.23	0.985	159.99
29 JUN 1986	6610.50	19 32	47.0	-26-40-10.8	0.4262	1.4332	-4.4859	-2.22	21.96	0.992	165.48
4 JUL 1986	6615.50	19 27	27.7	-27-10 -5.8	0.4151	1.4280	-3.2227	-2.34	22.55	0.997	170.73
9 JUL 1986	6620.50	19 21	24.8	-27-37-51.8	0.4077	1.4230	-1.9204	-2.42	22.97	0.999	174.34
14 JUL 1986	6625.50	19 15	2.5	-28 -1-48.4	0.4040	1.4181	-0.6215	-2.43	23.17	0.998	-172.65
19 JUL 1986	6630.50	19 8	47.6	-28-20-40.6	0.4040	1.4136	0.6311	-2.39	23.17	0.994	-167.68

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6635.50	19 3	5.1	-28-33-50.4	0.4076	1.4093	1.8185	-2.31	22.97	0.988	-162.10
29 JUL 1986	6640.50	18 58	16.5	-28-41-9.9	0.4145	1.4052	2.9375	-2.23	22.59	0.979	-158.51
3 AUG 1986	6645.50	18 54	39.7	-28-42-54.7	0.4245	1.4014	3.9732	-2.12	22.06	0.968	-151.10
8 AUG 1986	6650.50	18 52	28.2	-28-39-37.1	0.4373	1.3980	4.9088	-2.01	21.41	0.957	-145.95
13 AUG 1986	6655.50	18 51	49.9	-28-31-55.6	0.4527	1.3948	5.7288	-1.90	20.68	0.945	-141.11
18 AUG 1986	6660.50	18 52	46.0	-28-20-28.3	0.4703	1.3919	6.4385	-1.77	19.91	0.933	-136.60
23 AUG 1986	6665.50	18 55	12.6	-28-5-44.6	0.4898	1.3894	7.0680	-1.65	19.11	0.922	-132.40
28 AUG 1986	6670.50	18 59	3.9	-27-47-60.0	0.5110	1.3872	7.6367	-1.53	18.32	0.911	-128.50
2 SEP 1986	6675.50	19 4	13.9	-27-27-20.3	0.5339	1.3853	8.1470	-1.41	17.54	0.901	-124.88
7 SEP 1986	6680.50	19 10	35.9	-27-3-43.8	0.5580	1.3838	8.5969	-1.29	16.78	0.892	-121.62
12 SEP 1986	6685.50	19 18	2.9	-26-37-3.6	0.5834	1.3827	8.9890	-1.17	16.05	0.884	-118.39
17 SEP 1986	6690.50	19 26	26.5	-26-7-12.9	0.6099	1.3819	9.3393	-1.06	15.35	0.877	-115.48
22 SEP 1986	6695.50	19 35	38.3	-25-34-2.0	0.6374	1.3814	9.6705	-0.95	14.89	0.871	-112.75
27 SEP 1986	6700.50	19 45	31.5	-24-57-20.2	0.6658	1.3816	9.9912	-0.84	14.06	0.866	-110.17
2 OCT 1986	6705.50	19 56	0.5	-24-16-57.5	0.6951	1.3823	10.2953	-0.74	13.47	0.862	-107.74
7 OCT 1986	6710.50	20 7	0.2	-23-32-45.2	0.7252	1.3833	10.5749	-0.64	12.91	0.859	-105.44
12 OCT 1986	6715.50	20 18	25.7	-22-44-39.2	0.7561	1.3833	10.8310	-0.54	12.38	0.856	-103.24
17 OCT 1986	6720.50	20 30	11.4	-21-52-40.7	0.7877	1.3847	11.0773	-0.44	11.88	0.854	-101.15
22 OCT 1986	6725.50	20 42	13.0	-20-58-52.0	0.8201	1.3864	11.3276	-0.35	11.42	0.853	-99.13
27 OCT 1986	6730.50	20 54	27.1	-19-57-17.4	0.8532	1.3884	11.5811	-0.26	10.97	0.852	-97.19
1 NOV 1986	6735.50	21 6	51.2	-18-54-1.9	0.8870	1.3908	11.8264	-0.17	10.56	0.852	-95.30
6 NOV 1986	6740.50	21 19	23.1	-17-47-12.5	0.9215	1.3935	12.0534	-0.08	10.16	0.852	-93.46
11 NOV 1986	6745.50	21 32	0.5	-16-37-1.7	0.9566	1.3966	12.2649	0.00	9.79	0.853	-91.67
16 NOV 1986	6750.50	21 44	41.1	-15-23-44.9	0.9923	1.3999	12.4733	0.08	9.43	0.854	-89.92
21 NOV 1986	6755.50	21 57	23.3	-14-7-37.5	1.0286	1.4036	12.6869	0.16	9.10	0.855	-88.20
26 NOV 1986	6760.50	22 10	6.2	-12-48-54.7	1.0658	1.4075	12.9002	0.24	8.79	0.857	-86.50
1 DEC 1986	6765.50	22 22	49.4	-11-27-50.6	1.1031	1.4117	13.0992	0.32	8.49	0.859	-84.83
6 DEC 1986	6770.50	22 35	32.6	-10-4-40.9	1.1412	1.4162	13.2756	0.39	8.20	0.862	-83.17
11 DEC 1986	6775.50	22 48	15.2	-8-39-45.4	1.1798	1.4209	13.4351	0.46	7.94	0.864	-81.53
16 DEC 1986	6780.50	23 0	56.6	-7-13-24.0	1.2188	1.4258	13.5893	0.54	7.68	0.867	-79.80
21 DEC 1986	6785.50	23 13	36.9	-5-45-55.4	1.2582	1.4310	13.7428	0.61	7.44	0.870	-78.28
26 DEC 1986	6790.50	23 26	16.3	-4-17-37.1	1.2981	1.4364	13.8878	0.67	7.21	0.873	-76.66
31 DEC 1986	6795.50	23 38	55.6	-2-48-44.4	1.3384	1.4419	14.0090	0.74	6.99	0.876	-75.05

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	23 51 35.1	-1-19-35.2	1.3790	1.4476	14.1022	0.80	6.79	0.880	-73.44
10 JAN 1987	6805.50	0 4 15.0	0 9 31.0	1.4199	1.4535	14.1761	0.87	6.59	0.883	-71.84
15 JAN 1987	6810.50	0 16 55.5	1 38 15.1	1.4609	1.4595	14.2412	0.93	6.41	0.887	-70.25
20 JAN 1987	6815.50	0 29 37.3	3 6 19.5	1.5021	1.4658	14.3000	0.99	6.23	0.890	-68.65
25 JAN 1987	6820.50	0 42 20.9	4 33 28.4	1.5435	1.4719	14.3420	1.05	6.07	0.894	-67.05
30 JAN 1987	6825.50	0 55 7.4	5 59 27.4	1.5849	1.4782	14.3636	1.10	5.91	0.898	-65.46
4 FEB 1987	6830.50	1 7 57.2	7 23 59.2	1.6263	1.4846	14.3348	1.16	5.76	0.901	-63.86
9 FEB 1987	6835.50	1 20 50.8	8 46 46.5	1.6677	1.4910	14.2984	1.21	5.61	0.905	-62.27
14 FEB 1987	6840.50	1 33 48.3	10 7 32.4	1.7089	1.4975	14.2480	1.26	5.48	0.909	-60.68
19 FEB 1987	6845.50	1 46 50.3	11 26 1.3	1.7500	1.5040	14.1901	1.31	5.35	0.913	-59.09
24 FEB 1987	6850.50	1 59 57.7	12 41 59.8	1.7908	1.5106	14.1098	1.36	5.23	0.917	-57.50
1 MAR 1987	6855.50	2 13 10.8	13 55 14.3	1.8314	1.5171	13.9963	1.41	5.11	0.921	-55.91
6 MAR 1987	6860.50	2 26 29.9	15 5 29.4	1.8716	1.5236	13.8543	1.45	5.00	0.924	-54.33
11 MAR 1987	6865.50	2 39 55.2	16 12 30.7	1.9114	1.5301	13.6949	1.49	4.90	0.928	-52.74
16 MAR 1987	6870.50	2 53 26.5	17 16 3.9	1.9507	1.5366	13.5270	1.53	4.80	0.932	-51.16
21 MAR 1987	6875.50	3 7 4.1	18 15 56.5	1.9895	1.5430	13.3486	1.57	4.71	0.935	-49.59
26 MAR 1987	6880.50	3 20 48.1	19 11 57.9	2.0278	1.5493	13.1449	1.61	4.62	0.939	-48.01
31 MAR 1987	6885.50	3 34 38.4	20 3 56.6	2.0654	1.5556	12.9092	1.65	4.53	0.943	-46.43
5 APR 1987	6890.50	3 48 34.8	20 51 41.6	2.1023	1.5617	12.6493	1.68	4.45	0.946	-44.86
10 APR 1987	6895.50	4 2 36.5	21 35 2.7	2.1385	1.5678	12.3762	1.71	4.38	0.949	-43.29
15 APR 1987	6900.50	4 16 43.0	22 13 50.5	2.1738	1.5738	12.0980	1.74	4.31	0.953	-41.73
20 APR 1987	6905.50	4 30 53.8	22 47 58.2	2.2083	1.5796	11.8087	1.77	4.24	0.956	-40.16
25 APR 1987	6910.50	4 45 8.4	23 17 19.8	2.2420	1.5853	11.4932	1.80	4.18	0.959	-38.60
30 APR 1987	6915.50	4 59 26.1	23 41 49.7	2.2747	1.5909	11.1494	1.83	4.12	0.962	-37.04
5 MAY 1987	6920.50	5 13 45.9	24 1 24.0	2.3063	1.5963	10.7869	1.85	4.06	0.965	-35.48
10 MAY 1987	6925.50	5 28 6.5	24 15 59.9	2.3370	1.6016	10.4163	1.87	4.01	0.968	-33.92
15 MAY 1987	6930.50	5 42 27.0	24 25 35.7	2.3665	1.6067	10.0439	1.89	3.96	0.971	-32.37
20 MAY 1987	6935.50	5 56 46.6	24 30 12.6	2.3950	1.6116	9.6594	1.91	3.91	0.973	-30.81
25 MAY 1987	6940.50	6 11 4.4	24 29 51.6	2.4223	1.6163	9.2494	1.93	3.86	0.976	-29.26
30 MAY 1987	6945.50	6 25 19.5	24 24 35.5	2.4484	1.6209	8.8162	1.94	3.82	0.978	-27.70
4 JUN 1987	6950.50	6 39 30.7	24 14 28.9	2.4732	1.6253	8.3694	1.96	3.79	0.981	-26.15
9 JUN 1987	6955.50	6 53 37.0	23 59 37.2	2.4967	1.6294	7.9199	1.97	3.75	0.983	-24.60
14 JUN 1987	6960.50	7 7 37.5	23 40 6.8	2.5189	1.6334	7.4709	1.98	3.72	0.985	-23.04
19 JUN 1987	6965.50	7 21 31.8	23 16 5.7	2.5398	1.6372	7.0083	1.99	3.69	0.987	-21.48
24 JUN 1987	6970.50	7 35 19.2	22 47 41.3	2.5594	1.6407	6.5223	2.00	3.66	0.989	-19.92
29 JUN 1987	6975.50	7 48 59.4	22 15 3.3	2.5775	1.6441	6.0183	2.00	3.63	0.990	-18.36
4 JUL 1987	6980.50	8 2 31.6	21 38 22.3	2.5941	1.6472	5.5059	2.01	3.61	0.992	-16.79
9 JUL 1987	6985.50	8 15 55.4	20 57 48.6	2.6093	1.6500	4.9961	2.01	3.59	0.993	-15.23
14 JUL 1987	6990.50	8 29 10.8	20 13 33.7	2.6230	1.6527	4.4875	2.01	3.57	0.995	-13.66
19 JUL 1987	6995.50	8 42 17.7	19 25 48.0	2.6352	1.6551	3.9842	2.01	3.55	0.996	-12.08

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1987	7000.50	8 55 16.5	18 34 42.4	2.6459	1.6573	3.4211	2.01	3.54	0.997	-10.50
29 JUL 1987	7005.50	9 8 7.0	17 40 29.4	2.6549	1.6592	2.8651	2.00	3.53	0.998	-8.91
3 AUG 1987	7010.50	9 20 49.3	16 43 21.3	2.6624	1.6609	2.3068	1.99	3.52	0.998	-7.33
8 AUG 1987	7015.50	9 33 23.7	15 43 30.1	2.6683	1.6624	1.7657	1.99	3.51	0.999	-5.75
13 AUG 1987	7020.50	9 45 50.5	14 41 7.9	2.6725	1.6636	1.2057	1.98	3.50	1.000	-4.17
18 AUG 1987	7025.50	9 58 10.5	13 36 25.1	2.6752	1.6646	0.6414	1.97	3.50	1.000	-2.65
23 AUG 1987	7030.50	10 10 24.2	12 29 33.1	2.6762	1.6653	0.0624	1.96	3.50	1.000	-1.36
28 AUG 1987	7035.50	10 22 32.1	11 20 44.7	2.6756	1.6658	-0.5237	1.96	3.50	1.000	1.43
2 SEP 1987	7040.50	10 34 34.5	10 10 11.6	2.6732	1.6660	-1.1053	1.97	3.50	1.000	2.77
7 SEP 1987	7045.50	10 46 32.1	8 58 6.2	2.6692	1.6660	-1.6745	1.98	3.51	0.999	4.34
12 SEP 1987	7050.50	10 58 25.7	7 44 39.0	2.6635	1.6657	-2.2429	1.99	3.51	0.999	5.96
17 SEP 1987	7055.50	11 10 16.2	6 30 0.2	2.6562	1.6652	-2.8226	2.00	3.52	0.998	7.62
22 SEP 1987	7060.50	11 22 4.3	5 14 21.3	2.6472	1.6644	-3.4106	2.00	3.54	0.998	9.29
27 SEP 1987	7065.50	11 33 50.6	3 57 54.6	2.6365	1.6634	-3.9982	2.01	3.55	0.997	10.98
2 OCT 1987	7070.50	11 45 35.7	2 40 51.8	2.6241	1.6621	-4.5726	2.01	3.57	0.996	12.68
7 OCT 1987	7075.50	11 57 20.4	1 23 24.9	2.6101	1.6606	-5.1303	2.01	3.59	0.994	14.39
12 OCT 1987	7080.50	12 9 5.6	0 5 44.1	2.5945	1.6588	-5.6857	2.01	3.61	0.993	16.11
17 OCT 1987	7085.50	12 20 52.3	-1 11-60.0	2.5773	1.6569	-6.2466	2.01	3.63	0.991	17.84
22 OCT 1987	7090.50	12 32 41.1	-2 29-35.1	2.5584	1.6546	-6.8078	2.01	3.66	0.990	19.58
27 OCT 1987	7095.50	12 44 32.7	-3 46-48.7	2.5380	1.6522	-7.3591	2.00	3.69	0.988	21.33
1 NOV 1987	7100.50	12 56 27.8	-5 -3-28.0	2.5160	1.6495	-7.8875	1.99	3.72	0.986	23.09
6 NOV 1987	7105.50	13 8 27.1	-6 19-20.6	2.4924	1.6465	-8.3953	1.98	3.76	0.984	24.86
11 NOV 1987	7110.50	13 20 31.5	-7 34-15.7	2.4675	1.6434	-8.8971	1.97	3.79	0.981	26.63
16 NOV 1987	7115.50	13 32 41.7	-8 48 -1.0	2.4411	1.6400	-9.3967	1.96	3.84	0.979	28.40
21 NOV 1987	7120.50	13 44 58.5	-10 0-22.8	2.4132	1.6364	-9.8875	1.95	3.88	0.976	30.19
26 NOV 1987	7125.50	13 57 22.3	-11 11 -7.5	2.3840	1.6326	-10.3572	1.93	3.93	0.974	31.97
1 DEC 1987	7130.50	14 9 53.4	-12 20 -0.7	2.3534	1.6286	-10.7954	1.91	3.98	0.971	33.76
6 DEC 1987	7135.50	14 22 32.6	-13 26-49.6	2.3217	1.6244	-11.2096	1.89	4.03	0.968	35.55
11 DEC 1987	7140.50	14 35 20.5	-14 31-21.9	2.2887	1.6200	-11.6132	1.87	4.09	0.965	37.34
16 DEC 1987	7145.50	14 48 17.4	-15 33-23.4	2.2546	1.6154	-12.0067	1.84	4.15	0.962	39.13
21 DEC 1987	7150.50	15 1 23.8	-16 32-40.1	2.2194	1.6106	-12.3823	1.82	4.22	0.958	40.92
26 DEC 1987	7155.50	15 14 39.4	-17 28-57.3	2.1831	1.6056	-12.7268	1.79	4.29	0.955	42.71
31 DEC 1987	7160.50	15 28 4.4	-18 22 -0.7	2.1459	1.6005	-13.0341	1.76	4.36	0.951	44.50

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	7165.50	15 41 38.8	-19-11-38.4	2.1079	1.5952	-13.3161	1.73	4.44	0.948	46.27	
10 JAN 1988	7170.50	15 55 22.8	-19-57-37.6	2.0690	1.5898	-13.5838	1.69	4.52	0.944	48.04	
15 JAN 1988	7175.50	16 9 18.2	-20-39-45.5	2.0294	1.5842	-13.8359	1.68	4.61	0.940	49.81	
20 JAN 1988	7180.50	16 23 18.4	-21-17-50.1	1.9891	1.5784	-14.0832	1.62	4.71	0.936	51.56	
25 JAN 1988	7185.50	16 37 28.5	-21-51-39.4	1.9482	1.5726	-14.2529	1.58	4.81	0.932	53.31	
30 JAN 1988	7190.50	16 51 46.0	-22-21-3.5	1.9088	1.5668	-14.4052	1.54	4.91	0.928	55.05	
4 FEB 1988	7195.50	17 6 10.4	-22-45-54.4	1.8651	1.5605	-14.5341	1.49	5.02	0.925	56.77	
9 FEB 1988	7200.50	17 20 40.9	-23-6-4.0	1.8229	1.5543	-14.6484	1.45	5.14	0.920	58.48	
14 FEB 1988	7205.50	17 35 16.5	-23-21-25.9	1.7805	1.5481	-14.7455	1.40	5.26	0.916	60.18	
19 FEB 1988	7210.50	17 49 55.9	-23-31-55.5	1.7378	1.5417	-14.8146	1.35	5.39	0.912	61.86	
24 FEB 1988	7215.50	18 4 37.6	-23-37-29.2	1.6949	1.5353	-14.8457	1.30	5.52	0.908	63.53	
29 FEB 1988	7220.50	18 19 20.7	-23-38-6.4	1.6521	1.5289	-14.8445	1.25	5.67	0.904	65.19	
5 MAR 1988	7225.50	18 34 4.0	-23-33-47.5	1.6092	1.5224	-14.8257	1.19	5.82	0.900	66.83	
10 MAR 1988	7230.50	18 48 46.7	-23-24-34.3	1.5685	1.5158	-14.7983	1.14	5.98	0.896	68.46	
15 MAR 1988	7235.50	19 3 27.3	-23-10-31.2	1.5238	1.5093	-14.7517	1.08	6.14	0.892	70.07	
20 MAR 1988	7240.50	19 18 4.2	-22-51-44.8	1.4813	1.5028	-14.6803	1.02	6.32	0.889	71.67	
25 MAR 1988	7245.50	19 32 36.2	-22-28-23.2	1.4390	1.4963	-14.5782	0.95	6.51	0.885	73.26	
30 MAR 1988	7250.50	19 47 2.4	-22-0-36.4	1.3971	1.4898	-14.4490	0.89	6.70	0.881	74.83	
4 APR 1988	7255.50	20 1 22.1	-21-28-34.5	1.3556	1.4834	-14.3132	0.83	6.91	0.878	76.40	
9 APR 1988	7260.50	20 15 34.6	-20-52-29.5	1.3145	1.4770	-14.1735	0.76	7.12	0.874	77.95	
14 APR 1988	7265.50	20 29 38.8	-20-12-36.9	1.2737	1.4707	-14.0232	0.69	7.35	0.871	79.50	
19 APR 1988	7270.50	20 43 33.4	-19-29-13.4	1.2335	1.4645	-13.8504	0.62	7.59	0.868	81.04	
24 APR 1988	7275.50	20 57 17.9	-18-42-36.5	1.1938	1.4584	-13.6536	0.55	7.84	0.865	82.58	
29 APR 1988	7280.50	21 10 51.7	-17-53-3.5	1.1548	1.4524	-13.4449	0.47	8.11	0.862	84.12	
4 MAY 1988	7285.50	21 24 14.7	-17-0-51.6	1.1161	1.4466	-13.2372	0.39	8.39	0.859	85.67	
9 MAY 1988	7290.50	21 37 26.5	-16-6-20.6	1.0782	1.4409	-13.0330	0.32	8.68	0.857	87.22	
14 MAY 1988	7295.50	21 50 28.1	-15-9-53.6	1.0409	1.4354	-12.8222	0.24	8.99	0.855	88.78	
19 MAY 1988	7300.50	22 3 12.6	-14-11-54.2	1.0042	1.4301	-12.5943	0.16	9.32	0.853	90.36	
24 MAY 1988	7305.50	22 15 45.3	-13-12-45.4	0.9681	1.4250	-12.3509	0.07	9.67	0.852	91.97	
29 MAY 1988	7310.50	22 28 3.9	-12-12-48.6	0.9328	1.4201	-12.1050	-0.01	10.04	0.851	93.61	
3 JUN 1988	7315.50	22 40 8.0	-11-12-25.4	0.8982	1.4154	-11.8677	-0.10	10.42	0.850	95.28	
8 JUN 1988	7320.50	22 51 58.6	-10-12-1.5	0.8643	1.4110	-11.6369	-0.19	10.83	0.850	96.99	
13 JUN 1988	7325.50	23 3 28.0	-9-12-5.5	0.8310	1.4069	-11.3994	-0.28	11.27	0.850	98.76	
18 JUN 1988	7330.50	23 14 40.5	-8-13-6.1	0.7985	1.4030	-11.1461	-0.38	11.73	0.851	100.59	
23 JUN 1988	7335.50	23 25 32.4	-7-15-28.8	0.7666	1.3994	-10.8802	-0.48	12.21	0.853	102.50	
28 JUN 1988	7340.50	23 36 2.4	-6-19-37.7	0.7356	1.3961	-10.6137	-0.58	12.73	0.855	104.50	
3 JUL 1988	7345.50	23 46 8.4	-5-25-58.4	0.7053	1.3931	-10.3537	-0.68	13.27	0.857	106.59	
8 JUL 1988	7350.50	23 55 47.3	-4-35-1.6	0.6758	1.3905	-10.0909	-0.78	13.85	0.861	108.80	
13 JUL 1988	7355.50	0 4 55.1	-3-47-20.6	0.6471	1.3882	-9.8079	-0.89	14.47	0.865	111.15	
18 JUL 1988	7360.50	0 13 27.6	-3-3-26.3	0.6192	1.3862	-9.4954	-1.00	15.12	0.870	113.65	

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	0 21 20.7	-2-23-44.7	0.5923	1.3845	-9.1552	-1.12	15.81	0.877	116.34
28 JUL 1988	7370.50	0 28 30.1	-1-48-39.6	0.5863	1.3832	-8.7954	-1.24	16.53	0.884	119.21
2 AUG 1988	7375.50	0 34 50.4	-1-18-37.9	0.5415	1.3823	-8.4131	-1.36	17.29	0.892	122.32
7 AUG 1988	7380.50	0 40 16.1	0-54-10.5	0.5178	1.3817	-7.9866	-1.48	18.08	0.901	125.67
12 AUG 1988	7385.50	0 44 36.8	0-35-45.7	0.4954	1.3815	-7.4928	-1.61	18.90	0.912	129.31
17 AUG 1988	7390.50	0 47 49.0	0-23-41.5	0.4746	1.3816	-6.9197	-1.74	19.73	0.923	133.28
22 AUG 1988	7395.50	0 49 46.8	0-18-1.9	0.4555	1.3821	-6.2659	-1.86	20.55	0.935	137.53
27 AUG 1988	7400.50	0 50 28.4	0-18-41.5	0.4385	1.3830	-5.5339	-1.99	21.35	0.947	142.15
1 SEP 1988	7405.50	0 49 45.2	0-25-27.1	0.4237	1.3842	-4.7103	-2.11	22.10	0.959	147.11
6 SEP 1988	7410.50	0 47 42.9	0-37-50.4	0.4114	1.3858	-3.7708	-2.23	22.76	0.971	152.42
11 SEP 1988	7415.50	0 44 23.7	0-54-56.3	0.4020	1.3877	-2.7084	-2.33	23.29	0.981	158.03
16 SEP 1988	7420.50	0 39 58.4	-1-15-15.2	0.3959	1.3899	-1.5381	-2.42	23.65	0.990	163.85
21 SEP 1988	7425.50	0 34 43.8	-1-36-52.5	0.3932	1.3925	-0.2919	-2.50	23.81	0.996	169.65
26 SEP 1988	7430.50	0 29 0.2	-1-57-48.2	0.3942	1.3954	0.2963	-2.54	23.75	0.999	174.57
1 OCT 1988	7435.50	0 23 9.4	-2-16-8.5	0.3990	1.3987	2.3108	-2.51	23.46	0.999	-174.32
6 OCT 1988	7440.50	0 17 33.4	-2-30-9.9	0.4078	1.4022	3.6333	-2.40	22.97	0.998	-169.30
11 OCT 1988	7445.50	0 12 33.4	-2-38-23.1	0.4199	1.4060	4.9275	-2.27	22.29	0.990	-163.63
16 OCT 1988	7450.50	0 8 27.7	-2-39-41.8	0.4360	1.4101	6.1557	-2.13	21.47	0.982	-157.80
21 OCT 1988	7455.50	0 5 29.0	-2-33-34.2	0.4554	1.4145	7.2903	-1.97	20.56	0.972	-152.29
26 OCT 1988	7460.50	0 3 43.5	-2-20-3.0	0.4780	1.4191	8.3285	-1.81	19.59	0.962	-147.05
31 OCT 1988	7465.50	0 3 12.5	-1-59-30.1	0.5034	1.4239	9.2872	-1.65	18.60	0.952	-142.11
5 NOV 1988	7470.50	0 3 54.5	-1-32-24.3	0.5315	1.4290	10.1720	-1.48	17.61	0.942	-137.46
10 NOV 1988	7475.50	0 5 46.7	0-59-15.4	0.5621	1.4342	10.9757	-1.32	16.66	0.932	-133.10
15 NOV 1988	7480.50	0 8 45.1	0-20-35.3	0.5948	1.4397	11.6933	-1.16	15.74	0.923	-129.02
20 NOV 1988	7485.50	0 12 44.0	0 22 57.4	0.6296	1.4453	12.3292	-1.00	14.87	0.915	-125.18
25 NOV 1988	7490.50	0 17 36.8	1 10 41.7	0.6660	1.4511	12.9033	-0.85	14.06	0.908	-121.57
30 NOV 1988	7495.50	0 23 17.5	2 2 0.5	0.7040	1.4571	13.4348	-0.70	13.30	0.901	-118.15
5 DEC 1988	7500.50	0 29 41.0	2 58 23.1	0.7435	1.4632	13.9241	-0.56	12.59	0.896	-114.90
10 DEC 1988	7505.50	0 36 43.4	3 53 23.7	0.7844	1.4693	14.3622	-0.42	11.94	0.891	-111.81
15 DEC 1988	7510.50	0 44 20.8	4 52 36.8	0.8284	1.4756	14.7445	-0.29	11.33	0.888	-108.86
20 DEC 1988	7515.50	0 52 29.4	5 53 33.8	0.8695	1.4820	15.0784	-0.16	10.77	0.885	-106.04
25 DEC 1988	7520.50	1 1 5.5	6 55 47.1	0.9135	1.4884	15.3810	-0.04	10.25	0.883	-103.32
30 DEC 1988	7525.50	1 10 6.2	7 58 51.9	0.9583	1.4949	15.6610	0.08	9.77	0.882	-100.69

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1989	7530.50	1 19	29.6	9 2	28.2	1.0039	1.5014	0.19	9.33	0.881	-98.14
9 JAN 1989	7535.50	1 29	14.3	10 6	17.4	1.0502	1.5079	0.30	8.91	0.880	-95.67
14 JAN 1989	7540.50	1 39	18.7	11 9	59.7	1.0970	1.5144	0.40	8.53	0.881	-93.27
19 JAN 1989	7545.50	1 49	41.1	12 13	13.5	1.1442	1.5210	0.50	8.18	0.881	-90.92
24 JAN 1989	7550.50	2 0	20.1	13 15	37.9	1.1918	1.5275	0.60	7.88	0.882	-88.64
29 JAN 1989	7555.50	2 11	14.8	14 18	54.2	1.2398	1.5339	0.69	7.55	0.884	-86.39
3 FEB 1989	7560.50	2 22	24.1	15 16	46.8	1.2877	1.5404	0.77	7.27	0.886	-84.19
8 FEB 1989	7565.50	2 33	48.2	16 15	0.2	1.3359	1.5467	0.86	7.01	0.888	-82.03
13 FEB 1989	7570.50	2 45	28.1	17 11	17.2	1.3841	1.5530	0.94	6.76	0.890	-79.91
18 FEB 1989	7575.50	2 57	17.0	18 5	20.7	1.4323	1.5592	1.01	6.54	0.892	-77.83
23 FEB 1989	7580.50	3 9	20.0	18 56	54.0	1.4803	1.5653	1.09	6.32	0.895	-75.78
28 FEB 1989	7585.50	3 21	34.5	19 45	42.7	1.5281	1.5713	1.16	6.13	0.898	-73.75
5 MAR 1989	7590.50	3 34	0.3	20 31	34.5	1.5767	1.5772	1.22	5.94	0.901	-71.75
10 MAR 1989	7595.50	3 46	37.0	21 14	16.3	1.6229	1.5830	1.28	5.77	0.904	-69.78
15 MAR 1989	7600.50	3 59	23.7	21 53	35.2	1.6697	1.5888	1.34	5.61	0.907	-67.83
20 MAR 1989	7605.50	4 12	19.4	22 29	19.0	1.7159	1.5941	1.40	5.46	0.911	-65.91
25 MAR 1989	7610.50	4 25	23.2	23 1	16.2	1.7618	1.5994	1.46	5.31	0.914	-64.01
30 MAR 1989	7615.50	4 38	34.5	23 29	18.0	1.8087	1.6046	1.51	5.18	0.918	-62.13
4 APR 1989	7620.50	4 51	52.5	23 53	16.7	1.8512	1.6098	1.56	5.06	0.921	-60.27
9 APR 1989	7625.50	5 5	16.5	24 13	4.5	1.8949	1.6144	1.60	4.94	0.924	-58.43
14 APR 1989	7630.50	5 18	45.4	24 28	35.5	1.9377	1.6191	1.65	4.83	0.928	-56.61
19 APR 1989	7635.50	5 32	17.7	24 39	44.3	1.9797	1.6235	1.69	4.73	0.931	-54.80
24 APR 1989	7640.50	5 45	52.4	24 46	27.3	2.0208	1.6278	1.73	4.63	0.935	-53.01
29 APR 1989	7645.50	5 59	28.7	24 48	42.9	2.0610	1.6318	1.76	4.54	0.938	-51.24
4 MAY 1989	7650.50	6 13	5.6	24 46	30.1	2.1002	1.6357	1.79	4.46	0.942	-49.48
9 MAY 1989	7655.50	6 26	42.4	24 39	48.8	2.1383	1.6393	1.83	4.38	0.945	-47.73
14 MAY 1989	7660.50	6 40	17.7	24 28	41.4	2.1762	1.6427	1.86	4.30	0.948	-46.00
19 MAY 1989	7665.50	6 53	50.4	24 13	10.6	2.2111	1.6459	1.88	4.23	0.952	-44.28
24 MAY 1989	7670.50	7 7	19.6	23 53	20.6	2.2457	1.6489	1.91	4.17	0.955	-42.57
29 MAY 1989	7675.50	7 20	44.8	23 29	16.6	2.2792	1.6516	1.93	4.11	0.958	-40.87
3 JUN 1989	7680.50	7 34	5.5	23 1	3.7	2.3114	1.6542	1.95	4.05	0.961	-39.17
8 JUN 1989	7685.50	7 47	21.0	22 28	49.3	2.3423	1.6564	1.97	4.00	0.964	-37.49
13 JUN 1989	7690.50	8 0	30.6	21 52	41.7	2.3718	1.6585	1.99	3.95	0.967	-35.82
18 JUN 1989	7695.50	8 13	33.7	21 12	49.1	2.4000	1.6603	2.00	3.90	0.970	-34.15
23 JUN 1989	7700.50	8 26	30.3	20 29	20.9	2.4268	1.6618	2.01	3.86	0.972	-32.49
28 JUN 1989	7705.50	8 39	20.2	19 42	25.9	2.4523	1.6632	2.02	3.82	0.975	-30.84
3 JUL 1989	7710.50	8 52	3.6	18 52	12.7	2.4763	1.6642	2.03	3.78	0.977	-29.19
8 JUL 1989	7715.50	9 4	40.4	17 58	52.3	2.4988	1.6651	2.04	3.75	0.980	-27.54
13 JUL 1989	7720.50	9 17	10.5	17 2	35.5	2.5198	1.6656	2.04	3.72	0.982	-25.90
18 JUL 1989	7725.50	9 29	34.1	16 3	33.1	2.5393	1.6660	2.05	3.69	0.984	-24.26

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1989	7730.50	9 41 51.5	15 1 55.6	2.5573	1.6680	5.9689	2.05	3.66	0.986	-22.63
28 JUL 1989	7735.50	9 54 3.2	13 57 52.4	2.5737	1.6659	5.4365	2.05	3.64	0.988	-20.99
2 AUG 1989	7740.50	10 6 10.0	12 51 33.6	2.5888	1.6654	4.8858	2.05	3.62	0.990	-19.35
7 AUG 1989	7745.50	10 18 11.9	11 43 11.1	2.6019	1.6648	4.3278	2.04	3.60	0.991	-17.72
12 AUG 1989	7750.50	10 30 9.5	10 32 56.0	2.6136	1.6639	3.7726	2.04	3.58	0.993	-16.09
17 AUG 1989	7755.50	10 42 3.4	9 20 59.4	2.6237	1.6627	3.2264	2.03	3.57	0.994	-14.45
22 AUG 1989	7760.50	10 53 54.1	8 7 31.7	2.6323	1.6613	2.6823	2.02	3.56	0.995	-12.82
27 AUG 1989	7765.50	11 5 42.8	6 52 42.0	2.6392	1.6596	2.1250	2.01	3.55	0.997	-11.18
1 SEP 1989	7770.50	11 17 30.0	5 36 41.7	2.6445	1.6577	1.5558	2.00	3.54	0.997	-9.54
6 SEP 1989	7775.50	11 29 16.4	4 19 42.3	2.6482	1.6558	0.9857	1.98	3.54	0.998	-7.91
11 SEP 1989	7780.50	11 41 2.6	3 1 55.5	2.6502	1.6532	0.4248	1.96	3.53	0.999	-6.27
16 SEP 1989	7785.50	11 52 49.4	1 43 32.9	2.6507	1.6506	-0.1225	1.95	3.53	0.999	-4.64
21 SEP 1989	7790.50	12 4 37.7	0 24 44.7	2.6495	1.6478	-0.6676	1.93	3.53	1.000	-3.03
26 SEP 1989	7795.50	12 16 28.6	0 54 18.6	2.6468	1.6447	-1.2228	1.91	3.54	1.000	-1.49
1 OCT 1989	7800.50	12 28 22.8	-2 13 24.5	2.6425	1.6414	-1.7824	1.89	3.54	1.000	0.87
6 OCT 1989	7805.50	12 40 20.9	-3 32 20.4	2.6365	1.6379	-2.3348	1.90	3.55	1.000	2.19
11 OCT 1989	7810.50	12 52 23.9	-4 50 53.0	2.6290	1.6342	-2.8708	1.90	3.56	1.000	3.79
16 OCT 1989	7815.50	13 4 32.3	-6 8 49.4	2.6200	1.6303	-3.3888	1.90	3.57	0.999	5.42
21 OCT 1989	7820.50	13 16 47.5	-7 25 58.0	2.6094	1.6262	-3.9034	1.90	3.59	0.999	7.07
26 OCT 1989	7825.50	13 29 10.1	-8 42 5.3	2.5974	1.6218	-4.4222	1.90	3.60	0.998	8.73
31 OCT 1989	7830.50	13 41 40.9	-9 56 56.9	2.5839	1.6173	-4.9362	1.90	3.62	0.997	10.39
5 NOV 1989	7835.50	13 54 20.6	-11 10 17.6	2.5689	1.6126	-5.4346	1.90	3.64	0.996	12.05
10 NOV 1989	7840.50	14 7 9.8	-12 21 51.5	2.5525	1.6077	-5.9082	1.89	3.67	0.995	13.71
15 NOV 1989	7845.50	14 20 9.1	-13 31 23.8	2.5348	1.6026	-6.3602	1.88	3.69	0.993	15.36
20 NOV 1989	7850.50	14 33 19.5	-14 38 39.9	2.5158	1.5974	-6.8061	1.88	3.72	0.992	17.02
25 NOV 1989	7855.50	14 46 41.5	-15 43 23.2	2.4955	1.5920	-7.2483	1.87	3.75	0.990	18.67
30 NOV 1989	7860.50	15 0 15.4	-16 45 16.9	2.4739	1.5864	-7.6765	1.85	3.78	0.988	20.32
5 DEC 1989	7865.50	15 14 1.4	-17 44 3.5	2.4512	1.5808	-8.0803	1.84	3.82	0.986	21.96
10 DEC 1989	7870.50	15 27 59.6	-18 39 25.3	2.4273	1.5749	-8.4521	1.83	3.86	0.984	23.59
15 DEC 1989	7875.50	15 42 10.4	-19 31 6.6	2.4024	1.5690	-8.8001	1.81	3.90	0.982	25.21
20 DEC 1989	7880.50	15 56 33.7	-20 18 50.8	2.3765	1.5630	-9.1386	1.79	3.94	0.979	26.83
25 DEC 1989	7885.50	16 11 9.5	-21 2 21.1	2.3496	1.5568	-9.4680	1.78	3.98	0.977	28.43
30 DEC 1989	7890.50	16 25 57.1	-21 41 21.4	2.3218	1.5506	-9.7720	1.76	4.03	0.974	30.02

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	16 40	55.9	-22-15-35.7	2.2932	1.5442	-10.0464	1.74	4.08	0.971	31.60
9 JAN 1990	7900.50	16 56	5.1	-22-44-49.6	2.2639	1.5378	-10.2851	1.71	4.14	0.968	33.16
14 JAN 1990	7905.50	17 11	24.0	-23-8-50.8	2.2338	1.5314	-10.5009	1.69	4.19	0.985	34.71
19 JAN 1990	7910.50	17 26	51.7	-23-27-27.4	2.2032	1.5249	-10.7053	1.66	4.25	0.962	36.24
24 JAN 1990	7915.50	17 42	27.0	-23-40-29.0	2.1720	1.5184	-10.8943	1.64	4.31	0.959	37.75
29 JAN 1990	7920.50	17 58	8.4	-23-47-47.8	2.1403	1.5119	-11.0582	1.61	4.37	0.956	39.24
3 FEB 1990	7925.50	18 13	54.2	-23-49-17.0	2.1082	1.5053	-11.1873	1.58	4.44	0.952	40.71
8 FEB 1990	7930.50	18 29	43.1	-23-44-53.4	2.0757	1.4988	-11.2827	1.55	4.51	0.949	42.16
13 FEB 1990	7935.50	18 45	33.8	-23-34-35.3	2.0430	1.4923	-11.3601	1.52	4.58	0.945	43.59
18 FEB 1990	7940.50	19 1	24.8	-23-18-22.8	2.0101	1.4858	-11.4277	1.49	4.66	0.941	44.99
23 FEB 1990	7945.50	19 17	14.7	-22-58-19.4	1.9771	1.4794	-11.4804	1.46	4.74	0.937	46.38
28 FEB 1990	7950.50	19 33	1.9	-22-28-31.0	1.9439	1.4731	-11.5090	1.43	4.82	0.934	47.74
5 MAR 1990	7955.50	19 48	44.8	-21-55-5.5	1.9106	1.4668	-11.5054	1.39	4.90	0.930	49.07
10 MAR 1990	7960.50	20 4	22.4	-21-16-13.3	1.8774	1.4607	-11.4761	1.36	4.99	0.928	50.39
15 MAR 1990	7965.50	20 19	54.0	-20-32-5.4	1.8444	1.4547	-11.4373	1.32	5.08	0.922	51.68
20 MAR 1990	7970.50	20 35	18.8	-19-42-55.0	1.8114	1.4488	-11.3948	1.29	5.17	0.918	52.94
25 MAR 1990	7975.50	20 50	36.1	-18-48-58.2	1.7786	1.4430	-11.3424	1.25	5.26	0.914	54.19
30 MAR 1990	7980.50	21 5	44.9	-17-50-32.8	1.7459	1.4374	-11.2710	1.22	5.38	0.910	55.42
4 APR 1990	7985.50	21 20	44.9	-16-47-57.5	1.7135	1.4320	-11.1753	1.18	5.46	0.906	56.62
9 APR 1990	7990.50	21 35	36.1	-16-41-31.3	1.6814	1.4268	-11.0660	1.14	5.57	0.902	57.81
14 APR 1990	7995.50	21 50	18.5	-14-31-32.6	1.6496	1.4219	-10.9584	1.10	5.68	0.898	58.97
19 APR 1990	8000.50	22 4	52.5	-13-18-22.0	1.6181	1.4171	-10.8556	1.07	5.79	0.894	60.13
24 APR 1990	8005.50	22 19	18.0	-12-2-22.1	1.5869	1.4126	-10.7512	1.03	5.90	0.891	61.27
29 APR 1990	8010.50	22 33	35.0	-10-43-55.9	1.5560	1.4083	-10.6349	0.99	6.02	0.887	62.40
4 MAY 1990	8015.50	22 47	43.9	-9-23-26.3	1.5255	1.4043	-10.5051	0.95	6.14	0.883	63.52
9 MAY 1990	8020.50	23 1	45.1	-8-1-14.2	1.4953	1.4006	-10.3751	0.91	6.26	0.879	64.63
14 MAY 1990	8025.50	23 15	39.6	-6-37-40.4	1.4655	1.3972	-10.2580	0.87	6.39	0.876	65.74
19 MAY 1990	8030.50	23 29	27.7	-5-13-7.3	1.4361	1.3941	-10.1547	0.83	6.52	0.872	66.85
24 MAY 1990	8035.50	23 43	9.7	-3-47-58.9	1.4069	1.3913	-10.0570	0.79	6.65	0.869	67.96
29 MAY 1990	8040.50	23 56	45.8	-2-22-38.9	1.3780	1.3889	-9.9546	0.75	6.79	0.866	69.08
3 JUN 1990	8045.50	0 10	16.3	0-57-29.4	1.3494	1.3867	-9.8489	0.71	6.94	0.863	70.21
8 JUN 1990	8050.50	0 23	42.0	0 27 10.1	1.3211	1.3850	-9.7541	0.67	7.09	0.860	71.35
13 JUN 1990	8055.50	0 37	3.3	1 51 0.2	1.2930	1.3835	-9.6806	0.62	7.24	0.857	72.51
18 JUN 1990	8060.50	0 50	20.3	3 13 39.8	1.2652	1.3825	-9.6267	0.58	7.40	0.854	73.69
23 JUN 1990	8065.50	1 3	33.0	4 34 47.1	1.2374	1.3817	-9.5816	0.54	7.57	0.852	74.90
28 JUN 1990	8070.50	1 16	40.9	5 54 1.2	1.2098	1.3814	-9.5354	0.49	7.74	0.850	76.14
3 JUL 1990	8075.50	1 29	43.8	7 11 4.8	1.1824	1.3814	-9.4921	0.45	7.92	0.848	77.42
8 JUL 1990	8080.50	1 42	41.7	8 25 43.3	1.1550	1.3818	-9.4652	0.40	8.11	0.846	78.74
13 JUL 1990	8085.50	1 55	34.2	9 37 41.7	1.1277	1.3825	-9.4620	0.35	8.30	0.845	80.11
18 JUL 1990	8090.50	2 8	20.5	10 46 44.5	1.1003	1.3836	-9.4772	0.31	8.51	0.844	81.53

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	2 20 59.2	11 52 36.8	1.0729	1.3850	-9.4988	0.25	8.73	0.843	83.01
28 JUL 1990	8100.50	2 33 28.5	12 55 6.0	1.0455	1.3888	-9.5120	0.20	8.95	0.842	84.58
2 AUG 1990	8105.50	2 45 47.2	13 54 4.6	1.0180	1.3889	-9.5286	0.15	9.20	0.842	86.19
7 AUG 1990	8110.50	2 57 53.8	14 49 27.6	0.9904	1.3914	-9.5578	0.09	9.45	0.843	87.90
12 AUG 1990	8115.50	3 9 46.2	15 41 10.3	0.9628	1.3942	-9.6028	0.03	9.72	0.843	89.70
17 AUG 1990	8120.50	3 21 21.8	16 29 9.1	0.9350	1.3973	-9.6528	-0.03	10.01	0.845	91.60
22 AUG 1990	8125.50	3 32 37.0	17 13 22.3	0.9070	1.4007	-9.6903	-0.16	10.32	0.847	93.62
27 AUG 1990	8130.50	3 43 28.2	17 53 52.2	0.8790	1.4044	-9.7080	-0.24	10.65	0.849	95.77
1 SEP 1990	8135.50	3 53 52.1	18 30 46.8	0.8510	1.4084	-9.7105	-0.31	11.00	0.852	98.08
6 SEP 1990	8140.50	4 3 44.9	19 4 15.8	0.8229	1.4127	-9.7052	-0.39	11.38	0.856	100.49
11 SEP 1990	8145.50	4 13 2.0	19 34 29.8	0.7949	1.4172	-9.6875	-0.47	11.78	0.861	103.10
16 SEP 1990	8150.50	4 21 37.7	20 1 41.3	0.7670	1.4220	-9.6369	-0.56	12.21	0.867	105.90
21 SEP 1990	8155.50	4 29 25.3	20 26 4.1	0.7393	1.4270	-9.5321	-0.66	12.68	0.873	108.91
26 SEP 1990	8160.50	4 36 18.6	20 47 58.1	0.7120	1.4322	-9.3635	-0.75	13.15	0.881	112.18
1 OCT 1990	8165.50	4 42 11.4	21 7 36.8	0.6853	1.4376	-9.1303	-0.86	13.68	0.889	115.68
6 OCT 1990	8170.50	4 46 50.8	21 25 23.7	0.6594	1.4431	-8.8307	-0.96	14.20	0.899	119.44
11 OCT 1990	8175.50	4 50 27.4	21 41 31.4	0.6344	1.4489	-8.4439	-1.07	14.76	0.909	123.54
16 OCT 1990	8180.50	4 52 34.8	21 56 9.2	0.6107	1.4548	-7.9361	-1.18	15.33	0.921	127.97
21 OCT 1990	8185.50	4 53 11.9	22 9 20.4	0.5887	1.4608	-7.2828	-1.29	15.90	0.933	132.77
26 OCT 1990	8190.50	4 52 14.4	22 21 2.2	0.5688	1.4669	-6.4739	-1.40	16.46	0.945	137.95
31 OCT 1990	8195.50	4 49 40.9	22 31 2.2	0.5515	1.4732	-5.5103	-1.50	16.98	0.958	143.51
5 NOV 1990	8200.50	4 45 33.8	22 38 57.9	0.5371	1.4795	-4.3916	-1.60	17.43	0.970	149.43
10 NOV 1990	8205.50	4 39 59.5	22 44 20.7	0.5263	1.4859	-3.1044	-1.68	17.79	0.981	155.71
15 NOV 1990	8210.50	4 33 10.6	22 46 41.0	0.5194	1.4924	-1.6476	-1.75	18.03	0.990	162.28
20 NOV 1990	8215.50	4 25 27.3	22 45 42.4	0.5169	1.4989	-0.0545	-1.79	18.11	0.998	169.05
25 NOV 1990	8220.50	4 17 15.9	22 41 31.8	0.5191	1.5054	1.6204	-1.76	18.03	0.999	175.81
30 NOV 1990	8225.50	4 9 5.0	22 34 40.9	0.5263	1.5119	3.3152	-1.64	17.79	1.000	-176.65
5 DEC 1990	8230.50	4 1 21.5	22 26 4.0	0.5382	1.5185	4.9849	-1.50	17.39	0.997	-170.03
10 DEC 1990	8235.50	3 54 27.8	22 16 48.7	0.5550	1.5250	6.6037	-1.36	16.87	0.991	-163.41
15 DEC 1990	8240.50	3 48 42.2	22 8 8.1	0.5763	1.5315	8.1368	-1.20	16.24	0.984	-157.01
20 DEC 1990	8245.50	3 44 17.6	22 1 12.5	0.6019	1.5379	9.5452	-1.04	15.55	0.975	-150.91
25 DEC 1990	8250.50	3 41 20.7	21 58 56.0	0.6313	1.5443	10.8048	-0.88	14.83	0.966	-145.15
30 DEC 1990	8255.50	3 39 52.4	21 55 50.8	0.6641	1.5506	11.9124	-0.88	14.10	0.956	-139.72

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1991	8260.50	3 39 49.1	21 58 7.8	0.7000	1.5568	12.8877	-0.72	13.38	0.947	-134.63
9 JAN 1991	8265.50	3 41 5.8	22 3 42.1	0.7385	1.5630	13.7507	-0.56	12.68	0.938	-129.86
14 JAN 1991	8270.50	3 43 38.9	22 12 20.6	0.7721	1.5690	14.5023	-0.41	12.01	0.930	-125.37
19 JAN 1991	8275.50	3 47 16.6	22 23 43.0	0.8293	1.5750	15.1386	-0.26	11.39	0.923	-121.15
24 JAN 1991	8280.50	3 51 58.7	22 37 22.0	0.8666	1.5808	15.6853	-0.12	10.80	0.916	-117.17
29 JAN 1991	8285.50	3 57 36.7	22 52 46.2	0.9125	1.5864	16.1003	0.02	10.26	0.911	-113.42
3 FEB 1991	8290.50	4 4 4.2	23 9 22.1	0.9595	1.5920	16.4675	0.15	9.76	0.907	-109.86
8 FEB 1991	8295.50	4 11 16.1	23 26 38.3	1.0075	1.5974	16.7768	0.27	9.29	0.903	-106.48
13 FEB 1991	8300.50	4 19 8.2	23 44 6.4	1.0584	1.6026	17.0220	0.39	8.86	0.900	-103.24
18 FEB 1991	8305.50	4 27 36.6	24 1 18.6	1.1058	1.6077	17.1972	0.50	8.47	0.898	-100.16
23 FEB 1991	8310.50	4 36 37.8	24 17 48.1	1.1558	1.6125	17.3083	0.61	8.10	0.897	-97.19
28 FEB 1991	8315.50	4 46 7.7	24 33 9.5	1.2057	1.6173	17.3725	0.71	7.76	0.896	-94.35
5 MAR 1991	8320.50	4 56 3.0	24 46 58.8	1.2559	1.6218	17.4046	0.80	7.45	0.896	-91.60
10 MAR 1991	8325.50	5 6 21.1	24 58 56.1	1.3082	1.6261	17.4039	0.89	7.17	0.896	-88.95
15 MAR 1991	8330.50	5 16 59.8	25 8 43.2	1.3564	1.6302	17.3600	0.98	6.90	0.897	-86.37
20 MAR 1991	8335.50	5 27 57.0	25 16 3.3	1.4084	1.6342	17.2868	1.06	6.66	0.898	-83.88
25 MAR 1991	8340.50	5 39 10.3	25 20 41.7	1.4561	1.6379	17.1330	1.14	6.43	0.899	-81.45
30 MAR 1991	8345.50	5 50 37.2	25 22 25.3	1.5053	1.6414	16.9748	1.21	6.22	0.901	-79.10
4 APR 1991	8350.50	6 2 15.8	25 21 2.6	1.5541	1.6447	16.8001	1.28	6.02	0.903	-76.80
9 APR 1991	8355.50	6 14 4.4	25 16 25.1	1.6023	1.6477	16.6032	1.34	5.84	0.905	-74.55
14 APR 1991	8360.50	6 26 1.6	25 8 25.0	1.6500	1.6508	16.3723	1.40	5.67	0.908	-72.35
19 APR 1991	8365.50	6 38 6.0	24 56 56.1	1.6969	1.6532	16.1040	1.46	5.52	0.910	-70.20
24 APR 1991	8370.50	6 50 15.8	24 41 55.1	1.7429	1.6555	15.8107	1.51	5.37	0.913	-68.09
29 APR 1991	8375.50	7 2 29.3	24 23 19.1	1.7882	1.6577	15.5063	1.56	5.24	0.916	-66.02
4 MAY 1991	8380.50	7 14 45.3	24 1 7.1	1.8325	1.6598	15.1934	1.61	5.11	0.919	-63.99
9 MAY 1991	8385.50	7 27 2.8	23 35 19.4	1.8759	1.6612	14.8638	1.65	4.99	0.922	-62.00
14 MAY 1991	8390.50	7 39 21.0	23 5 56.4	1.9183	1.6626	14.5055	1.69	4.88	0.925	-60.03
19 MAY 1991	8395.50	7 51 39.1	22 33 0.8	1.9598	1.6638	14.1194	1.73	4.78	0.928	-58.10
24 MAY 1991	8400.50	8 3 55.8	21 56 37.2	1.9998	1.6647	13.7202	1.76	4.68	0.931	-56.20
29 MAY 1991	8405.50	8 16 10.5	21 16 50.2	2.0389	1.6654	13.3182	1.79	4.59	0.935	-54.32
3 JUN 1991	8410.50	8 28 22.5	20 33 45.5	2.0768	1.6658	12.9126	1.82	4.51	0.938	-52.47
8 JUN 1991	8415.50	8 40 31.7	19 47 28.5	2.1134	1.6660	12.4932	1.85	4.43	0.941	-50.63
13 JUN 1991	8420.50	8 52 37.9	18 58 4.8	2.1489	1.6659	12.0490	1.88	4.36	0.944	-48.82
18 JUN 1991	8425.50	9 4 40.7	18 5 42.7	2.1830	1.6658	11.5858	1.90	4.29	0.947	-47.03
23 JUN 1991	8430.50	9 16 39.9	17 10 30.6	2.2158	1.6651	11.1186	1.92	4.23	0.951	-45.26
28 JUN 1991	8435.50	9 28 35.3	16 12 37.1	2.2472	1.6642	10.6541	1.93	4.17	0.954	-43.51
3 JUL 1991	8440.50	9 40 27.1	15 12 10.5	2.2773	1.6632	10.1890	1.95	4.11	0.957	-41.77
8 JUL 1991	8445.50	9 52 15.6	14 9 18.4	2.3061	1.6619	9.7113	1.96	4.06	0.960	-40.04
13 JUL 1991	8450.50	10 4 1.3	13 4 9.2	2.3334	1.6603	9.2126	1.97	4.01	0.963	-38.33
18 JUL 1991	8455.50	10 15 44.3	11 56 53.1	2.3593	1.6585	8.7035	1.98	3.97	0.965	-36.63

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1991	8460.50	10 27 24.8	10 47 40.2	2.3837	1.6565	8.1974	1.99	3.93	0.968		-34.95
28 JUL 1991	8465.50	10 39 3.2	9 36 40.6	2.4066	1.6542	7.6977	1.99	3.89	0.971		-33.27
2 AUG 1991	8470.50	10 50 40.1	8 24 3.3	2.4281	1.6517	7.1995	2.00	3.86	0.973		-31.60
7 AUG 1991	8475.50	11 2 16.4	7 9 56.9	2.4482	1.6490	6.6890	2.00	3.82	0.976		-29.94
12 AUG 1991	8480.50	11 13 52.6	5 54 31.3	2.4667	1.6460	6.1627	1.99	3.80	0.978		-28.29
17 AUG 1991	8485.50	11 25 29.3	4 37 57.9	2.4838	1.6428	5.6342	1.99	3.77	0.981		-26.65
22 AUG 1991	8490.50	11 37 6.9	3 20 27.8	2.4993	1.6394	5.1142	1.99	3.75	0.983		-25.01
27 AUG 1991	8495.50	11 48 46.3	2 2 12.2	2.5133	1.6358	4.6042	1.98	3.72	0.985		-23.38
1 SEP 1991	8500.50	12 0 28.3	0 43 20.9	2.5259	1.6319	4.0969	1.97	3.71	0.987		-21.76
6 SEP 1991	8505.50	12 12 13.9	0 -35-56.1	2.5370	1.6279	3.5785	1.96	3.69	0.989		-20.14
11 SEP 1991	8510.50	12 24 3.8	-1-55-26.3	2.5485	1.6236	3.0511	1.95	3.68	0.990		-18.52
16 SEP 1991	8515.50	12 35 58.8	-3-14-57.1	2.5546	1.6192	2.5296	1.94	3.66	0.992		-16.91
21 SEP 1991	8520.50	12 47 59.5	-4-34-15.1	2.5612	1.6145	2.0216	1.92	3.66	0.993		-15.30
26 SEP 1991	8525.50	13 0 6.8	-5-53-7.3	2.5663	1.6097	1.5277	1.91	3.65	0.995		-13.70
1 OCT 1991	8530.50	13 12 21.8	-7-11-21.7	2.5700	1.6047	1.0375	1.89	3.64	0.996		-12.10
6 OCT 1991	8535.50	13 24 45.3	-8-28-44.6	2.5723	1.5998	0.5391	1.87	3.64	0.997		-10.51
11 OCT 1991	8540.50	13 37 18.3	-9-45-0.8	2.5731	1.5942	0.0405	1.85	3.64	0.998		-8.92
16 OCT 1991	8545.50	13 50 1.4	-10-59-54.4	2.5725	1.5888	-0.4446	1.83	3.64	0.998		-7.34
21 OCT 1991	8550.50	14 2 55.1	-12-13-8.7	2.5708	1.5831	-0.9104	1.80	3.64	0.999		-5.76
26 OCT 1991	8555.50	14 16 0.3	-13-24-27.7	2.5673	1.5774	-1.3581	1.78	3.65	0.999		-4.19
31 OCT 1991	8560.50	14 29 18.0	-14-33-35.5	2.5627	1.5715	-1.8008	1.75	3.65	1.000		-2.62
5 NOV 1991	8565.50	14 42 48.7	-15-40-14.2	2.5589	1.5655	-2.2462	1.72	3.66	1.000		-1.06
10 NOV 1991	8570.50	14 56 33.0	-16-44-5.3	2.5498	1.5594	-2.6825	1.70	3.67	1.000		0.51
15 NOV 1991	8575.50	15 10 31.0	-17-44-49.3	2.5414	1.5532	-3.0980	1.70	3.68	1.000		2.05
20 NOV 1991	8580.50	15 24 42.9	-18-42-6.8	2.5319	1.5469	-3.4881	1.70	3.70	1.000		3.58
25 NOV 1991	8585.50	15 39 9.0	-19-35-39.3	2.5213	1.5405	-3.8569	1.70	3.71	0.999		5.11
30 NOV 1991	8590.50	15 53 49.5	-20-25-8.3	2.5098	1.5341	-4.2192	1.69	3.73	0.999		6.63
5 DEC 1991	8595.50	16 8 44.2	-21-10-14.3	2.4969	1.5276	-4.5773	1.68	3.75	0.998		8.13
10 DEC 1991	8600.50	16 23 52.6	-21-50-38.6	2.4832	1.5211	-4.9180	1.68	3.77	0.997		9.63
15 DEC 1991	8605.50	16 39 13.8	-22-26-2.7	2.4685	1.5146	-5.2319	1.67	3.79	0.996		11.11
20 DEC 1991	8610.50	16 54 47.1	-22-56-9.4	2.4530	1.5081	-5.5157	1.66	3.82	0.995		12.57
25 DEC 1991	8615.50	17 10 31.7	-23-20-44.0	2.4367	1.5015	-5.7775	1.65	3.84	0.994		14.02
30 DEC 1991	8620.50	17 26 26.4	-23-39-32.1	2.4197	1.4950	-6.0319	1.64	3.87	0.992		15.46

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1992	8625.50	17 42 29.9	-23-52-21.4	2.4019	1.4885	-6.2763	1.63	3.90	0.991	16.88	
9 JAN 1992	8630.50	17 58 40.6	-23-59-2.0	2.3834	1.4821	-6.4982	1.62	3.93	0.989	18.28	
14 JAN 1992	8635.50	18 14 56.5	-23-59-25.8	2.3644	1.4757	-6.6903	1.61	3.96	0.987	19.68	
19 JAN 1992	8640.50	18 31 16.1	-23-53-28.3	2.3448	1.4694	-6.8514	1.59	3.99	0.985	21.02	
24 JAN 1992	8645.50	18 47 37.6	-23-41-7.4	2.3248	1.4632	-6.9939	1.58	4.03	0.983	22.36	
29 JAN 1992	8650.50	19 3 59.6	-23-22-22.9	2.3044	1.4572	-7.1303	1.56	4.06	0.981	23.68	
3 FEB 1992	8655.50	19 20 20.3	-22-57-18.7	2.2837	1.4512	-7.2548	1.55	4.10	0.979	24.98	
8 FEB 1992	8660.50	19 36 37.8	-22-26-1.3	2.2625	1.4454	-7.3668	1.53	4.14	0.977	26.25	
13 FEB 1992	8665.50	19 52 50.5	-21-48-39.8	2.2412	1.4397	-7.4300	1.52	4.18	0.974	27.51	
18 FEB 1992	8670.50	20 8 57.3	-21-5-26.1	2.2197	1.4343	-7.4771	1.50	4.22	0.972	28.74	
23 FEB 1992	8675.50	20 24 57.1	-20-16-33.5	2.1980	1.4290	-7.5137	1.49	4.26	0.969	29.95	
28 FEB 1992	8680.50	20 40 49.3	-19-22-17.0	2.1763	1.4239	-7.5490	1.47	4.30	0.967	31.14	
4 MAR 1992	8685.50	20 56 33.0	-18-22-55.3	2.1544	1.4190	-7.5753	1.45	4.35	0.964	32.31	
9 MAR 1992	8690.50	21 12 7.4	-17-18-48.3	2.1325	1.4144	-7.5840	1.44	4.39	0.961	33.46	
14 MAR 1992	8695.50	21 27 32.2	-16-10-17.3	2.1106	1.4100	-7.5701	1.42	4.44	0.958	34.59	
19 MAR 1992	8700.50	21 42 47.4	-14-57-43.9	2.0888	1.4059	-7.5401	1.40	4.48	0.955	35.70	
24 MAR 1992	8705.50	21 57 53.3	-13-41-29.4	2.0671	1.4021	-7.5111	1.39	4.53	0.952	36.79	
29 MAR 1992	8710.50	22 12 50.3	-12-21-56.7	2.0454	1.3986	-7.4883	1.37	4.58	0.949	37.86	
3 APR 1992	8715.50	22 27 38.6	-10-59-30.5	2.0239	1.3953	-7.4636	1.35	4.63	0.946	38.92	
8 APR 1992	8720.50	22 42 18.5	-9-34-35.5	2.0023	1.3924	-7.4292	1.34	4.68	0.943	39.97	
13 APR 1992	8725.50	22 56 50.5	-8-7-36.7	1.9810	1.3898	-7.3812	1.32	4.73	0.940	41.00	
18 APR 1992	8730.50	23 11 15.5	-6-38-57.3	1.9597	1.3875	-7.3302	1.30	4.78	0.937	42.02	
23 APR 1992	8735.50	23 25 34.5	-5-8-59.7	1.9386	1.3856	-7.2923	1.29	4.83	0.934	43.04	
28 APR 1992	8740.50	23 39 48.2	-3-38-8.0	1.9176	1.3840	-7.2687	1.27	4.88	0.931	44.05	
3 MAY 1992	8745.50	23 53 57.4	-2-6-46.8	1.8966	1.3828	-7.2514	1.26	4.94	0.928	45.05	
8 MAY 1992	8750.50	0 8 2.7	0-35-20.4	1.8757	1.3819	-7.2320	1.24	4.99	0.925	46.06	
13 MAY 1992	8755.50	0 22 4.8	0 55-47.6	1.8549	1.3814	-7.2085	1.22	5.05	0.922	47.07	
18 MAY 1992	8760.50	0 36 4.7	2 26 16.4	1.8341	1.3813	-7.1943	1.21	5.10	0.919	48.07	
23 MAY 1992	8765.50	0 50 3.4	3 55 45.1	1.8133	1.3815	-7.2026	1.19	5.16	0.916	49.09	
28 MAY 1992	8770.50	1 4 1.6	5 23 51.9	1.7925	1.3820	-7.2317	1.18	5.22	0.913	50.11	
2 JUN 1992	8775.50	1 17 59.6	6 50 15.0	1.7715	1.3830	-7.2726	1.16	5.28	0.910	51.14	
7 JUN 1992	8780.50	1 31 57.9	8 14 32.8	1.7504	1.3843	-7.3160	1.15	5.35	0.908	52.19	
12 JUN 1992	8785.50	1 45 58.9	9 36 26.0	1.7293	1.3859	-7.3625	1.13	5.41	0.905	53.26	
17 JUN 1992	8790.50	1 59 57.1	10 55 37.8	1.7079	1.3879	-7.4270	1.12	5.48	0.902	54.34	
22 JUN 1992	8795.50	2 13 58.9	12 11 51.4	1.6863	1.3902	-7.5186	1.10	5.55	0.899	55.45	
27 JUN 1992	8800.50	2 28 2.4	13 24 49.5	1.6645	1.3929	-7.6332	1.08	5.62	0.896	56.58	
2 JUL 1992	8805.50	2 42 7.3	14 34 15.9	1.6422	1.3959	-7.7602	1.07	5.70	0.894	57.74	
7 JUL 1992	8810.50	2 56 13.0	15 39 55.2	1.6196	1.3991	-7.8899	1.05	5.78	0.891	58.93	
12 JUL 1992	8815.50	3 10 19.3	16 41 35.5	1.5967	1.4027	-8.0261	1.03	5.86	0.889	60.16	
17 JUL 1992	8820.50	3 24 25.9	17 39 7.4	1.5733	1.4066	-8.1831	1.01	5.95	0.886	61.42	

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1992	8825.50	3 38 32.2	18 32 21.6	1.5494	1.4108	-8.3664	0.99	6.04	0.884	62.73
27 JUL 1992	8830.50	3 52 37.2	19 21 10.3	1.5249	1.4152	-8.5693	0.97	6.14	0.882	64.07
1 AUG 1992	8835.50	4 6 39.5	20 5 27.2	1.4999	1.4199	-8.7790	0.94	6.24	0.880	65.47
6 AUG 1992	8840.50	4 20 37.6	20 45 8.5	1.4742	1.4248	-8.9869	0.92	6.35	0.878	66.92
11 AUG 1992	8845.50	4 34 30.4	21 20 14.4	1.4480	1.4299	-9.1995	0.89	6.47	0.876	68.42
16 AUG 1992	8850.50	4 48 16.4	21 50 47.1	1.4211	1.4352	-9.4293	0.86	6.59	0.874	69.98
21 AUG 1992	8855.50	5 1 54.3	22 16 50.2	1.3935	1.4407	-9.6783	0.83	6.72	0.873	71.61
26 AUG 1992	8860.50	5 15 22.0	22 38 30.1	1.3652	1.4464	-9.9363	0.80	6.86	0.872	73.30
31 AUG 1992	8865.50	5 28 37.1	22 55 55.4	1.3361	1.4522	-10.1885	0.77	7.01	0.870	75.06
5 SEP 1992	8870.50	5 41 37.5	23 9 17.7	1.3063	1.4582	-10.4285	0.73	7.17	0.870	76.91
10 SEP 1992	8875.50	5 54 21.3	23 18 52.3	1.2759	1.4643	-10.6646	0.69	7.34	0.869	78.83
15 SEP 1992	8880.50	6 6 46.7	23 24 55.4	1.2447	1.4705	-10.9062	0.64	7.52	0.869	80.85
20 SEP 1992	8885.50	6 18 51.3	23 27 46.4	1.2129	1.4768	-11.1505	0.60	7.72	0.869	82.96
25 SEP 1992	8890.50	6 30 32.4	23 27 47.4	1.1804	1.4832	-11.3926	0.55	7.93	0.869	85.17
30 SEP 1992	8895.50	6 41 47.0	23 25 22.7	1.1472	1.4897	-11.5860	0.49	8.16	0.870	87.51
5 OCT 1992	8900.50	6 52 32.2	23 20 59.7	1.1135	1.4961	-11.7568	0.43	8.41	0.872	89.96
10 OCT 1992	8905.50	7 2 45.6	23 15 7.2	1.0793	1.5027	-11.9022	0.37	8.67	0.874	92.55
15 OCT 1992	8910.50	7 12 24.1	23 8 15.8	1.0447	1.5092	-12.0261	0.30	8.96	0.877	95.28
20 OCT 1992	8915.50	7 21 24.5	23 0 59.4	1.0099	1.5157	-12.1179	0.23	9.27	0.880	98.18
25 OCT 1992	8920.50	7 29 42.0	22 53 54.5	0.9748	1.5223	-12.1546	0.15	9.60	0.884	101.25
30 OCT 1992	8925.50	7 37 12.2	22 47 39.5	0.9398	1.5288	-12.1179	0.07	9.96	0.889	104.52
4 NOV 1992	8930.50	7 43 50.5	22 42 52.9	0.9049	1.5352	-12.0031	-0.02	10.35	0.894	108.00
9 NOV 1992	8935.50	7 49 32.2	22 40 12.4	0.8705	1.5417	-11.8110	-0.12	10.75	0.901	111.71
14 NOV 1992	8940.50	7 54 12.0	22 40 15.8	0.8368	1.5480	-11.5346	-0.22	11.19	0.909	115.67
19 NOV 1992	8945.50	7 57 43.5	22 43 40.6	0.8040	1.5543	-11.1481	-0.32	11.64	0.917	119.92
24 NOV 1992	8950.50	7 59 59.6	22 50 59.8	0.7725	1.5605	-10.6181	-0.43	12.12	0.927	124.47
29 NOV 1992	8955.50	8 0 54.1	23 2 36.5	0.7428	1.5666	-9.9258	-0.54	12.60	0.937	129.36
4 DEC 1992	8960.50	8 0 22.2	23 18 38.5	0.7164	1.5726	-9.0659	-0.65	13.09	0.947	134.58
9 DEC 1992	8965.50	7 58 20.7	23 38 55.7	0.6906	1.5784	-8.0366	-0.76	13.56	0.958	140.15
14 DEC 1992	8970.50	7 54 48.2	24 2 58.8	0.6691	1.5842	-6.6292	-0.87	13.99	0.969	146.06
19 DEC 1992	8975.50	7 49 46.5	24 29 54.8	0.6514	1.5898	-5.4254	-0.98	14.37	0.979	152.30
24 DEC 1992	8980.50	7 43 22.7	24 58 24.2	0.6380	1.5952	-3.8266	-1.07	14.67	0.987	158.81
29 DEC 1992	8985.50	7 35 50.8	25 26 47.4	0.6294	1.6005	-2.0708	-1.15	14.87	0.994	165.47

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1993	8990.50	7 27 31.6	25 53 18.0	0.6261	1.6058	-0.2137	-1.22	14.95	0.998	171.97
8 JAN 1993	8995.50	7 18 49.9	26 18 23.3	0.6282	1.6106	1.6858	-1.24	14.90	1.000	175.97
13 JAN 1993	9000.50	7 10 12.0	26 34 58.6	0.6358	1.6154	3.5810	-1.17	14.72	0.998	-171.79
18 JAN 1993	9005.50	7 2 3.6	26 48 30.8	0.6489	1.6200	5.4337	-1.06	14.43	0.994	-185.37
23 JAN 1993	9010.50	6 54 48.0	26 56 59.4	0.6671	1.6244	7.1899	-0.94	14.03	0.988	-158.84
28 JAN 1993	9015.50	6 48 44.1	27 0 51.1	0.6903	1.6286	8.7989	-0.81	13.56	0.980	-162.51
2 FEB 1993	9020.50	6 44 4.0	27 0 48.9	0.7178	1.6328	10.2269	-0.67	13.04	0.971	-146.46
7 FEB 1993	9025.50	6 40 52.8	26 57 41.0	0.7491	1.6364	11.4779	-0.52	12.50	0.962	-140.74
12 FEB 1993	9030.50	6 39 10.5	26 52 9.6	0.7839	1.6400	12.5883	-0.38	11.94	0.953	-135.34
17 FEB 1993	9035.50	6 38 54.1	26 44 45.8	0.8216	1.6434	13.5120	-0.24	11.39	0.944	-130.26
22 FEB 1993	9040.50	6 39 59.3	26 35 50.6	0.8618	1.6466	14.3057	-0.10	10.86	0.936	-125.50
27 FEB 1993	9045.50	6 42 20.2	26 25 34.8	0.9041	1.6495	14.9509	0.03	10.36	0.929	-121.02
4 MAR 1993	9050.50	6 45 49.7	26 14 2.3	0.9480	1.6522	15.4633	0.16	9.88	0.922	-116.81
9 MAR 1993	9055.50	6 50 20.2	26 1 11.0	0.9933	1.6547	15.8690	0.28	9.43	0.917	-112.84
14 MAR 1993	9060.50	6 55 44.5	25 46 53.6	1.0396	1.6589	16.1921	0.39	9.01	0.912	-109.10
19 MAR 1993	9065.50	7 1 56.6	25 31 0.6	1.0867	1.6589	16.4388	0.50	8.61	0.908	-105.54
24 MAR 1993	9070.50	7 8 51.1	25 13 20.5	1.1344	1.6606	16.6033	0.61	8.25	0.905	-102.17
29 MAR 1993	9075.50	7 16 23.0	24 53 42.0	1.1825	1.6621	16.6873	0.71	7.92	0.902	-98.96
3 APR 1993	9080.50	7 24 27.3	24 31 55.6	1.2308	1.6634	16.7055	0.80	7.61	0.901	-95.89
8 APR 1993	9085.50	7 32 59.1	24 7 52.4	1.2790	1.6644	16.6785	0.89	7.32	0.900	-92.96
13 APR 1993	9090.50	7 41 54.7	23 41 24.1	1.3271	1.6652	16.6171	0.97	7.05	0.899	-90.14
18 APR 1993	9095.50	7 51 11.0	23 12 23.5	1.3749	1.6657	16.5162	1.05	6.81	0.899	-87.43
23 APR 1993	9100.50	8 0 45.3	22 40 43.7	1.4224	1.6660	16.3688	1.12	6.58	0.900	-84.81
28 APR 1993	9105.50	8 10 35.0	22 6 20.6	1.4694	1.6660	16.1703	1.19	6.37	0.900	-82.29
3 MAY 1993	9110.50	8 20 37.5	21 29 12.7	1.5168	1.6658	15.9415	1.25	6.18	0.902	-79.85
8 MAY 1993	9115.50	8 30 50.4	20 49 19.2	1.5614	1.6653	15.6981	1.31	6.00	0.903	-77.48
13 MAY 1993	9120.50	8 41 12.1	20 6 40.2	1.6064	1.6646	15.4359	1.37	5.83	0.905	-75.18
18 MAY 1993	9125.50	8 51 41.2	19 21 15.5	1.6506	1.6636	15.1514	1.42	5.67	0.907	-72.94
23 MAY 1993	9130.50	9 2 16.7	18 33 6.2	1.6939	1.6624	14.8337	1.47	5.53	0.909	-70.75
28 MAY 1993	9135.50	9 12 57.4	17 42 16.0	1.7362	1.6609	14.4867	1.51	5.39	0.911	-68.63
2 JUN 1993	9140.50	9 23 42.1	16 48 49.8	1.7775	1.6592	14.1266	1.56	5.27	0.914	-66.55
7 JUN 1993	9145.50	9 34 30.0	15 52 52.9	1.8178	1.6573	13.7637	1.59	5.15	0.917	-64.52
12 JUN 1993	9150.50	9 45 20.5	14 54 30.7	1.8570	1.6551	13.3944	1.63	5.04	0.919	-62.52
17 JUN 1993	9155.50	9 56 13.5	13 53 47.5	1.8951	1.6527	13.0082	1.68	4.94	0.922	-60.57
22 JUN 1993	9160.50	10 7 8.9	12 50 49.3	1.9321	1.6501	12.5974	1.69	4.85	0.925	-58.65
27 JUN 1993	9165.50	10 18 6.3	11 45 43.9	1.9679	1.6472	12.1695	1.72	4.76	0.928	-56.77
2 JUL 1993	9170.50	10 29 5.4	10 38 39.9	2.0024	1.6441	11.7409	1.74	4.68	0.931	-54.92
7 JUL 1993	9175.50	10 40 6.3	9 29 45.8	2.0357	1.6407	11.3167	1.76	4.60	0.934	-53.10
12 JUL 1993	9180.50	10 51 9.2	8 19 9.1	2.0678	1.6372	10.8904	1.78	4.53	0.937	-51.30
17 JUL 1993	9185.50	11 2 14.5	7 6 56.8	2.0986	1.6334	10.4512	1.79	4.46	0.940	-49.53

GEOCENTRIC EPHEMERIS FOR MARS

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22 JUL 1993	9190.50	11 13 22.8	5 53 17.8	2.1281	1.6295	9.9935	1.81	4.40	0.944	-47.78
27 JUL 1993	9195.50	11 24 34.1	4 38 22.4	2.1583	1.6253	9.5291	1.82	4.34	0.947	-46.06
1 AUG 1993	9200.50	11 35 48.8	3 22 21.3	2.1831	1.6209	9.0724	1.83	4.29	0.950	-44.35
6 AUG 1993	9205.50	11 47 7.3	2 5 25.2	2.2087	1.6164	8.6241	1.84	4.24	0.953	-42.67
11 AUG 1993	9210.50	11 58 30.5	0 47 43.0	2.2330	1.6116	8.1763	1.84	4.19	0.955	-41.00
16 AUG 1993	9215.50	12 9 59.0	0-30-35.6	2.2559	1.6067	7.7182	1.85	4.15	0.958	-39.35
21 AUG 1993	9220.50	12 21 33.7	-1-49-18.6	2.2775	1.6016	7.2477	1.85	4.11	0.961	-37.71
26 AUG 1993	9225.50	12 33 14.9	-3-8-13.6	2.2978	1.5963	6.7798	1.85	4.07	0.964	-36.09
31 AUG 1993	9230.50	12 45 3.4	-4-27-6.9	2.3167	1.5909	6.3256	1.85	4.04	0.967	-34.49
5 SEP 1993	9235.50	12 56 59.8	-5-45-45.6	2.3343	1.5854	5.8826	1.84	4.01	0.969	-32.90
10 SEP 1993	9240.50	13 9 5.2	-7-3-57.6	2.3507	1.5797	5.4424	1.84	3.98	0.972	-31.32
15 SEP 1993	9245.50	13 21 20.5	-8-21-29.3	2.3657	1.5738	4.9940	1.83	3.96	0.974	-29.75
20 SEP 1993	9250.50	13 33 46.5	-9-38-5.2	2.3795	1.5679	4.5404	1.82	3.93	0.977	-28.19
25 SEP 1993	9255.50	13 46 23.7	-10-53-28.7	2.3920	1.5618	4.0982	1.81	3.91	0.979	-26.65
30 SEP 1993	9260.50	13 59 12.8	-12-7-22.5	2.4032	1.5557	3.6740	1.80	3.90	0.981	-25.12
5 OCT 1993	9265.50	14 12 14.7	-13-19-29.9	2.4132	1.5494	3.2639	1.79	3.88	0.983	-23.59
10 OCT 1993	9270.50	14 25 30.2	-14-29-34.3	2.4220	1.5431	2.8583	1.77	3.87	0.985	-22.08
15 OCT 1993	9275.50	14 38 00.0	-15-37-17.0	2.4297	1.5367	2.4476	1.76	3.85	0.987	-20.58
20 OCT 1993	9280.50	14 52 44.6	-16-42-18.2	2.4362	1.5302	2.0401	1.74	3.84	0.989	-19.09
25 OCT 1993	9285.50	15 6 44.2	-17-44-17.4	2.4415	1.5237	1.6513	1.72	3.83	0.990	-17.61
30 OCT 1993	9290.50	15 20 59.1	-18-42-53.3	2.4457	1.5172	1.2842	1.70	3.83	0.992	-16.14
4 NOV 1993	9295.50	15 35 29.5	-19-37-46.3	2.4489	1.5107	0.9341	1.68	3.82	0.993	-14.69
9 NOV 1993	9300.50	15 50 15.6	-20-28-36.0	2.4511	1.5042	0.5897	1.66	3.82	0.994	-13.24
14 NOV 1993	9305.50	16 5 17.3	-21-15-1.3	2.4523	1.4977	0.2442	1.64	3.82	0.995	-11.81
19 NOV 1993	9310.50	16 20 34.1	-21-56-41.7	2.4526	1.4912	-0.0897	1.62	3.82	0.996	-10.39
24 NOV 1993	9315.50	16 36 5.0	-22-33-16.6	2.4519	1.4847	-0.3995	1.59	3.82	0.997	-8.98
29 NOV 1993	9320.50	16 51 49.3	-23-4-27.0	2.4503	1.4783	-0.6847	1.57	3.82	0.998	-7.60
4 DEC 1993	9325.50	17 7 46.0	-23-29-56.2	2.4479	1.4726	-0.9514	1.55	3.82	0.999	-6.22
9 DEC 1993	9330.50	17 23 54.0	-23-49-28.2	2.4448	1.4658	-1.2125	1.52	3.83	0.999	-4.87
14 DEC 1993	9335.50	17 40 11.8	-24-2-48.9	2.4409	1.4597	-1.4705	1.49	3.84	1.000	-3.54
19 DEC 1993	9340.50	17 56 37.6	-24-9-47.0	2.4363	1.4537	-1.7106	1.47	3.84	1.000	-2.25
24 DEC 1993	9345.50	18 13 9.4	-24-10-13.3	2.4311	1.4478	-1.9243	1.44	3.85	1.000	-1.12
29 DEC 1993	9350.50	18 29 45.2	-24-4-2.2	2.4252	1.4421	-2.1127	1.43	3.86	1.000	0.94

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	18 46	23.4	-23-51-11.1	2.4189	1.4365	-2.2842	1.42	3.87	1.000	1.97
8 JAN 1994	9360.50	19 3	2.1	-23-31-39.6	2.4120	1.4312	-2.4524	1.42	3.88	1.000	3.17
13 JAN 1994	9365.50	19 19	39.5	-23-5-31.5	2.4047	1.4260	-2.6150	1.42	3.89	0.999	4.40
18 JAN 1994	9370.50	19 36	13.4	-22-32-53.9	2.3970	1.4211	-2.7679	1.42	3.91	0.999	5.62
23 JAN 1994	9375.50	19 52	42.3	-21-53-56.6	2.3888	1.4164	-2.8760	1.42	3.92	0.998	6.83
28 JAN 1994	9380.50	20 9	4.6	-21-8-52.5	2.3804	1.4119	-2.9717	1.42	3.93	0.998	8.02
2 FEB 1994	9385.50	20 25	19.3	-20-17-56.2	2.3717	1.4077	-3.0566	1.41	3.95	0.997	9.20
7 FEB 1994	9390.50	20 41	25.7	-19-21-24.3	2.3627	1.4037	-3.1434	1.41	3.96	0.996	10.36
12 FEB 1994	9395.50	20 57	22.8	-18-19-36.9	2.3535	1.4001	-3.2256	1.41	3.98	0.995	11.51
17 FEB 1994	9400.50	21 13	9.9	-17-12-55.7	2.3441	1.3967	-3.2913	1.41	3.99	0.994	12.64
22 FEB 1994	9405.50	21 28	46.7	-16-1-43.6	2.3345	1.3937	-3.3376	1.41	4.01	0.993	13.75
27 FEB 1994	9410.50	21 44	13.1	-14-46-24.2	2.3248	1.3910	-3.3688	1.40	4.03	0.992	14.85
4 MAR 1994	9415.50	21 59	29.4	-13-27-20.5	2.3151	1.3886	-3.3995	1.40	4.04	0.990	15.93
9 MAR 1994	9420.50	22 14	36.2	-12-4-57.1	2.3052	1.3865	-3.4392	1.40	4.06	0.989	17.01
14 MAR 1994	9425.50	22 29	33.7	-10-39-40.0	2.2952	1.3848	-3.4787	1.40	4.08	0.987	18.06
19 MAR 1994	9430.50	22 44	22.3	-9-11-55.4	2.2851	1.3834	-3.5085	1.40	4.10	0.986	19.11
24 MAR 1994	9435.50	22 59	2.7	-7-42-9.3	2.2749	1.3824	-3.5270	1.40	4.12	0.984	20.15
29 MAR 1994	9440.50	23 13	35.9	-6-10-46.4	2.2647	1.3817	-3.5405	1.40	4.13	0.983	21.18
3 APR 1994	9445.50	23 28	2.8	-4-38-10.2	2.2545	1.3814	-3.5652	1.40	4.15	0.981	22.20
8 APR 1994	9450.50	23 42	24.5	-3-4-45.6	2.2441	1.3815	-3.6063	1.40	4.17	0.979	23.21
13 APR 1994	9455.50	23 56	41.7	-1-30-57.7	2.2337	1.3819	-3.6530	1.40	4.19	0.977	24.22
18 APR 1994	9460.50	0 10	55.3	0 2 48.7	2.2230	1.3827	-3.6978	1.41	4.21	0.975	25.23
23 APR 1994	9465.50	0 25	6.1	1 36 9.5	2.2123	1.3838	-3.7389	1.41	4.23	0.974	26.24
28 APR 1994	9470.50	0 39	15.3	3 8 43.0	2.2014	1.3853	-3.7858	1.41	4.25	0.972	27.25
3 MAY 1994	9475.50	0 53	24.0	4 40 8.3	2.1904	1.3872	-3.8541	1.41	4.27	0.969	28.26
8 MAY 1994	9480.50	1 7	32.9	6 10 2.8	2.1792	1.3894	-3.9439	1.41	4.30	0.967	29.27
13 MAY 1994	9485.50	1 21	42.7	7 38 4.8	2.1676	1.3919	-4.0441	1.42	4.32	0.965	30.29
18 MAY 1994	9490.50	1 35	54.1	9 3 52.8	2.1558	1.3947	-4.1477	1.42	4.34	0.963	31.33
23 MAY 1994	9495.50	1 50	7.5	10 27 6.6	2.1437	1.3979	-4.2537	1.42	4.37	0.961	32.37
28 MAY 1994	9500.50	2 4	23.8	11 47 28.8	2.1312	1.4014	-4.3740	1.42	4.39	0.959	33.42
2 JUN 1994	9505.50	2 18	43.4	13 4 41.8	2.1184	1.4051	-4.5219	1.43	4.42	0.956	34.48
7 JUN 1994	9510.50	2 33	6.8	14 18 27.6	2.1051	1.4092	-4.6931	1.43	4.45	0.954	35.57
12 JUN 1994	9515.50	2 47	33.9	15 28 29.3	2.0913	1.4135	-4.8768	1.43	4.48	0.952	36.67
17 JUN 1994	9520.50	3 2	4.4	16 34 30.9	2.0769	1.4180	-5.0652	1.43	4.51	0.949	37.79
22 JUN 1994	9525.50	3 16	38.3	17 38 18.4	2.0620	1.4228	-5.2591	1.43	4.54	0.947	38.93
27 JUN 1994	9530.50	3 31	15.6	18 33 40.6	2.0465	1.4278	-5.4729	1.43	4.57	0.944	40.09
2 JUL 1994	9535.50	3 45	55.9	19 26 26.2	2.0304	1.4331	-5.7155	1.43	4.61	0.942	41.28
7 JUL 1994	9540.50	4 0	38.6	20 14 25.2	2.0135	1.4385	-5.9795	1.43	4.65	0.939	42.50
12 JUL 1994	9545.50	4 15	22.6	20 57 29.1	1.9958	1.4441	-6.2539	1.43	4.69	0.937	43.75
17 JUL 1994	9550.50	4 30	7.0	21 35 31.2	1.9774	1.4499	-6.5309	1.43	4.73	0.934	45.03

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2449000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1994	9555.50	4 44 50.9	22 8 27.9	1.9581	1.4558	-6.8141	1.43	4.78	0.932	46.34
27 JUL 1994	9560.50	4 59 33.2	22 36 17.5	1.9380	1.4618	-7.1183	1.42	4.83	0.929	47.68
1 AUG 1994	9565.50	5 14 12.9	22 58 59.5	1.9170	1.4680	-7.4479	1.41	4.88	0.926	49.06
6 AUG 1994	9570.50	5 28 48.7	23 16 35.8	1.8950	1.4743	-7.7932	1.41	4.94	0.924	50.48
11 AUG 1994	9575.50	5 43 18.7	23 29 10.0	1.8720	1.4806	-8.1428	1.40	5.00	0.921	51.94
16 AUG 1994	9580.50	5 57 41.7	23 36 48.0	1.8479	1.4870	-8.4894	1.39	5.07	0.919	53.44
21 AUG 1994	9585.50	6 11 56.3	23 39 38.6	1.8229	1.4935	-8.8401	1.38	5.14	0.916	54.99
26 AUG 1994	9590.50	6 26 1.4	23 37 51.1	1.7969	1.5000	-9.2055	1.36	5.21	0.913	56.58
31 AUG 1994	9595.50	6 39 55.8	23 31 37.2	1.7697	1.5065	-9.5943	1.35	5.29	0.911	58.23
5 SEP 1994	9600.50	6 53 38.0	23 21 10.7	1.7414	1.5131	-9.9860	1.33	5.38	0.908	59.92
10 SEP 1994	9605.50	7 7 6.4	23 6 46.6	1.7120	1.5198	-10.3710	1.31	5.47	0.906	61.67
15 SEP 1994	9610.50	7 20 19.9	22 48 42.0	1.6816	1.5261	-10.7444	1.28	5.57	0.904	63.48
20 SEP 1994	9615.50	7 33 17.6	22 27 14.6	1.6500	1.5328	-11.1183	1.26	5.67	0.902	65.35
25 SEP 1994	9620.50	7 45 58.6	22 2 42.3	1.6173	1.5390	-11.4967	1.23	5.79	0.900	67.27
30 SEP 1994	9625.50	7 58 21.9	21 35 25.6	1.5838	1.5454	-11.8812	1.20	5.91	0.898	69.27
5 OCT 1994	9630.50	8 10 26.3	21 5 46.0	1.5487	1.5517	-12.2558	1.16	6.04	0.896	71.34
10 OCT 1994	9635.50	8 22 10.5	20 34 6.7	1.5128	1.5579	-12.6073	1.13	6.19	0.894	73.48
15 OCT 1994	9640.50	8 33 33.4	20 0 51.1	1.4759	1.5641	-12.9343	1.08	6.34	0.893	75.71
20 OCT 1994	9645.50	8 44 34.4	19 28 21.6	1.4381	1.5701	-13.2477	1.04	6.51	0.892	78.01
25 OCT 1994	9650.50	8 55 12.5	18 51 2.4	1.3994	1.5760	-13.5525	0.99	6.69	0.891	80.41
30 OCT 1994	9655.50	9 5 26.4	18 15 19.8	1.3599	1.5818	-13.8394	0.94	6.88	0.891	82.90
4 NOV 1994	9660.50	9 15 14.3	17 39 42.0	1.3196	1.5874	-14.0907	0.88	7.09	0.891	85.50
9 NOV 1994	9665.50	9 24 34.2	17 4 38.3	1.2786	1.5930	-14.2935	0.82	7.32	0.892	88.22
14 NOV 1994	9670.50	9 33 24.6	16 30 37.2	1.2370	1.5983	-14.4498	0.75	7.57	0.893	91.06
19 NOV 1994	9675.50	9 41 43.7	15 58 7.2	1.1951	1.6035	-14.5667	0.68	7.83	0.894	94.03
24 NOV 1994	9680.50	9 49 29.1	15 27 39.9	1.1530	1.6086	-14.6426	0.60	8.12	0.897	97.14
29 NOV 1994	9685.50	9 56 37.7	14 59 50.1	1.1106	1.6134	-14.6599	0.52	8.43	0.899	100.42
4 DEC 1994	9690.50	10 3 5.8	14 35 14.9	1.0684	1.6181	-14.5949	0.43	8.76	0.903	103.88
9 DEC 1994	9695.50	10 8 49.4	14 14 31.5	1.0264	1.6226	-14.4355	0.33	9.12	0.908	107.53
14 DEC 1994	9700.50	10 13 44.7	13 58 14.6	0.9851	1.6269	-14.1823	0.23	9.50	0.913	111.39
19 DEC 1994	9705.50	10 17 47.3	13 46 59.1	0.9446	1.6310	-13.8338	0.13	9.91	0.919	115.48
24 DEC 1994	9710.50	10 20 52.2	13 41 21.9	0.9053	1.6349	-13.3756	0.02	10.34	0.926	119.82
29 DEC 1994	9715.50	10 22 53.5	13 41 58.4	0.8675	1.6386	-12.7774	-0.10	10.79	0.934	124.45

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1995	9720.50	10 23 45.6	13 49 18.0	0.8317	1.6420	-12.0114	-0.21	11.26	0.943	129.37	
8 JAN 1995	9725.50	10 23 23.6	14 3 36.3	0.7983	1.6453	-11.0705	-0.33	11.73	0.952	134.61	
13 JAN 1995	9730.50	10 21 44.7	14 24 50.5	0.7679	1.6483	-9.9567	-0.45	12.19	0.962	140.16	
18 JAN 1995	9735.50	10 18 47.4	14 52 40.2	0.7410	1.6511	-8.8694	-0.57	12.64	0.971	146.03	
23 JAN 1995	9740.50	10 14 32.4	15 26 23.5	0.7180	1.6536	-7.2014	-0.69	13.04	0.980	152.20	
28 JAN 1995	9745.50	10 9 4.3	16 4 49.2	0.6995	1.6560	-5.5480	-0.79	13.38	0.988	158.62	
2 FEB 1995	9750.50	10 2 32.5	16 46 14.6	0.6861	1.6581	-3.7283	-0.89	13.64	0.994	165.16	
7 FEB 1995	9755.50	9 55 12.8	17 28 30.4	0.6781	1.6599	-1.8083	-0.97	13.81	0.998	171.50	
12 FEB 1995	9760.50	9 47 25.0	18 9 19.7	0.6757	1.6615	0.1582	-1.01	13.85	0.999	175.45	
17 FEB 1995	9765.50	9 39 31.0	18 46 38.5	0.6790	1.6629	2.1105	-0.96	13.79	0.998	-171.78	
22 FEB 1995	9770.50	9 31 52.9	19 18 46.2	0.6879	1.6640	4.0090	-0.88	13.61	0.994	-165.51	
27 FEB 1995	9775.50	9 24 51.7	19 44 30.8	0.7021	1.6649	5.8137	-0.78	13.33	0.989	-159.02	
4 MAR 1995	9780.50	9 18 45.6	20 3 11.5	0.7213	1.6655	7.4715	-0.67	12.98	0.981	-152.67	
9 MAR 1995	9785.50	9 13 48.2	20 14 38.2	0.7450	1.6659	8.9426	-0.55	12.57	0.972	-146.58	
14 MAR 1995	9790.50	9 10 7.5	20 19 7.7	0.7728	1.6680	10.2186	-0.42	12.12	0.963	-140.79	
19 MAR 1995	9795.50	9 7 45.9	20 17 12.0	0.8039	1.6689	11.3126	-0.30	11.65	0.954	-135.33	
24 MAR 1995	9800.50	9 6 42.3	20 9 26.3	0.8379	1.6655	12.2457	-0.17	11.17	0.945	-130.20	
29 MAR 1995	9805.50	9 6 53.9	19 56 22.9	0.8745	1.6649	13.0272	-0.05	10.71	0.936	-125.37	
3 APR 1995	9810.50	9 8 16.3	19 38 29.2	0.9130	1.6640	13.6542	0.07	10.25	0.928	-120.85	
8 APR 1995	9815.50	9 10 44.2	19 16 10.5	0.9532	1.6629	14.1364	0.18	9.82	0.921	-116.60	
13 APR 1995	9820.50	9 14 10.8	18 49 50.1	0.9946	1.6615	14.4982	0.29	9.41	0.915	-112.61	
18 APR 1995	9825.50	9 18 29.7	18 19 46.7	1.0368	1.6599	14.7673	0.40	9.03	0.910	-108.85	
23 APR 1995	9830.50	9 23 34.7	17 46 14.6	1.0798	1.6581	14.9615	0.50	8.67	0.906	-105.30	
28 APR 1995	9835.50	9 29 21.0	17 9 22.8	1.1232	1.6560	15.0803	0.59	8.34	0.902	-101.94	
3 MAY 1995	9840.50	9 35 44.0	16 29 18.5	1.1668	1.6537	15.1199	0.68	8.02	0.899	-98.74	
8 MAY 1995	9845.50	9 42 39.2	15 46 10.2	1.2104	1.6511	15.0890	0.76	7.73	0.897	-95.71	
13 MAY 1995	9850.50	9 50 2.5	15 0 6.9	1.2539	1.6483	15.0076	0.84	7.47	0.895	-92.81	
18 MAY 1995	9855.50	9 57 50.2	14 11 18.4	1.2971	1.6453	14.8937	0.91	7.22	0.894	-90.04	
23 MAY 1995	9860.50	10 5 59.4	13 19 45.3	1.3399	1.6421	14.7508	0.98	6.99	0.894	-87.39	
28 MAY 1995	9865.50	10 14 27.8	12 25 37.8	1.3822	1.6386	14.5698	1.04	6.77	0.894	-84.84	
2 JUN 1995	9870.50	10 23 13.7	11 28 59.6	1.4240	1.6350	14.3458	1.10	6.57	0.894	-82.38	
7 JUN 1995	9875.50	10 32 15.0	10 29 58.7	1.4650	1.6311	14.0871	1.15	6.39	0.895	-80.01	
12 JUN 1995	9880.50	10 41 29.9	9 28 43.7	1.5053	1.6270	13.8111	1.20	6.22	0.896	-77.73	
17 JUN 1995	9885.50	10 50 57.0	8 25 23.3	1.5448	1.6227	13.5287	1.25	6.06	0.898	-75.51	
22 JUN 1995	9890.50	11 0 35.5	7 20 4.8	1.5835	1.6182	13.2348	1.29	5.91	0.899	-73.36	
27 JUN 1995	9895.50	11 10 24.9	6 12 54.0	1.6212	1.6135	12.9188	1.33	5.77	0.901	-71.28	
2 JUL 1995	9900.50	11 20 24.8	5 3 59.7	1.6580	1.6087	12.5771	1.37	5.65	0.903	-69.24	
7 JUL 1995	9905.50	11 30 34.4	3 53 32.0	1.6938	1.6036	12.2194	1.40	5.53	0.906	-67.27	
12 JUL 1995	9910.50	11 40 53.5	2 41 41.7	1.7286	1.5984	11.8624	1.43	5.42	0.908	-65.34	
17 JUL 1995	9915.50	11 51 21.7	1 28 39.6	1.7624	1.5931	11.5103	1.46	5.31	0.911	-63.46	

GEOCENTRIC EPHEMERIS FOR MARS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	12 1 59.3	0 14 34.8	1.7951	1.5876	11.1541	1.48	5.22	0.913		-61.61
27 JUL 1995	9925.50	12 12 46.7	-1 0-23.6	1.8268	1.5819	10.7841	1.51	5.12	0.916		-59.81
1 AUG 1995	9930.50	12 23 44.2	-2-16 -3.6	1.8574	1.5761	10.3985	1.52	5.04	0.919		-58.04
6 AUG 1995	9935.50	12 34 51.8	-3-32-12.3	1.8868	1.5702	10.0098	1.54	4.96	0.922		-56.31
11 AUG 1995	9940.50	12 46 9.9	-4-48-35.8	1.9152	1.5642	9.6324	1.56	4.89	0.925		-54.61
16 AUG 1995	9945.50	12 57 38.7	-6 -5 -0.4	1.9425	1.5581	9.2651	1.57	4.82	0.927		-52.94
21 AUG 1995	9950.50	13 9 19.3	-7-21-14.1	1.9687	1.5518	8.8977	1.58	4.76	0.930		-51.29
26 AUG 1995	9955.50	13 21 12.2	-8-37 -3.0	1.9938	1.5455	8.5216	1.59	4.70	0.933		-49.68
31 AUG 1995	9960.50	13 33 18.0	-9-52-11.0	2.0179	1.5392	8.1377	1.60	4.64	0.936		-48.08
5 SEP 1995	9965.50	13 45 37.2	-11 -6-21.2	2.0408	1.5327	7.7609	1.60	4.59	0.939		-46.51
10 SEP 1995	9970.50	13 58 10.3	-12-19-15.1	2.0627	1.5263	7.4020	1.60	4.54	0.942		-44.97
15 SEP 1995	9975.50	14 10 57.8	-13-30-35.3	2.0836	1.5197	7.0557	1.61	4.49	0.945		-43.44
20 SEP 1995	9980.50	14 24 0.8	-14-40 -4.7	2.1035	1.5132	6.7121	1.61	4.45	0.948		-41.93
25 SEP 1995	9985.50	14 37 19.8	-15-47-23.7	2.1224	1.5067	6.3636	1.60	4.41	0.951		-40.44
30 SEP 1995	9990.50	14 50 55.1	-16-52-11.6	2.1402	1.5002	6.0142	1.60	4.37	0.954		-38.97
5 OCT 1995	9995.50	15 4 47.1	-17-54 -6.7	2.1571	1.4937	5.6803	1.60	4.34	0.957		-37.52
10 OCT 1995	10000.50	15 18 55.8	-18-52-48.3	2.1731	1.4872	5.3681	1.59	4.31	0.959		-36.08
15 OCT 1995	10005.50	15 33 21.4	-19-47-49.6	2.1881	1.4808	5.0699	1.59	4.28	0.962		-34.66
20 OCT 1995	10010.50	15 48 4.2	-20-38-54.9	2.2024	1.4744	4.7762	1.58	4.25	0.964		-33.26
25 OCT 1995	10015.50	16 3 4.0	-21-26-39.8	2.2157	1.4682	4.4802	1.57	4.23	0.967		-31.87
30 OCT 1995	10020.50	16 18 20.2	-22 -7-42.2	2.2282	1.4620	4.1901	1.56	4.20	0.969		-30.49
4 NOV 1995	10025.50	16 33 51.9	-22-44-39.9	2.2399	1.4560	3.9217	1.55	4.18	0.972		-29.13
9 NOV 1995	10030.50	16 49 38.1	-23-16-12.4	2.2509	1.4500	3.6761	1.54	4.16	0.974		-27.79
14 NOV 1995	10035.50	17 5 37.9	-23-42 -1.3	2.2612	1.4443	3.4449	1.53	4.14	0.976		-26.46
19 NOV 1995	10040.50	17 21 50.0	-24 -1-49.4	2.2708	1.4387	3.2184	1.52	4.12	0.978		-25.14
24 NOV 1995	10045.50	17 38 13.0	-24-15-21.1	2.2798	1.4332	2.9913	1.51	4.11	0.980		-23.83
29 NOV 1995	10050.50	17 54 44.7	-24-22-23.9	2.2881	1.4280	2.7756	1.50	4.09	0.982		-22.54
4 DEC 1995	10055.50	18 11 23.1	-24-22-47.6	2.2958	1.4230	2.5843	1.49	4.08	0.984		-21.27
9 DEC 1995	10060.50	18 28 6.2	-24-18-25.6	2.3030	1.4182	2.4145	1.47	4.07	0.986		-20.00
14 DEC 1995	10065.50	18 44 51.9	-24 -3-14.7	2.3098	1.4136	2.2576	1.46	4.05	0.987		-18.76
19 DEC 1995	10070.50	19 1 38.4	-23-43-14.4	2.3161	1.4093	2.1029	1.45	4.04	0.989		-17.52
24 DEC 1995	10075.50	19 18 23.7	-23-16-28.1	2.3219	1.4052	1.9478	1.44	4.03	0.990		-16.30
29 DEC 1995	10080.50	19 35 5.6	-22-43 -3.2	2.3273	1.4015	1.8069	1.42	4.02	0.992		-15.09

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	6435.50	21 27	12.1	-15-51-19.2	5.8109	5.0347	15.3140	-1.60	33.84	0.997	-34.78
10 JAN 1988	6440.50	21 31	32.5	-15-30-31.2	5.8529	5.0333	13.7271	-1.58	33.59	0.997	-30.79
15 JAN 1988	6445.50	21 35	57.6	-15-9-07.7	5.8902	5.0319	12.0752	-1.57	33.38	0.999	-26.82
20 JAN 1988	6450.50	21 40	26.5	-14-46-50.8	5.9226	5.0305	10.3812	-1.56	33.20	0.999	-22.87
25 JAN 1988	6455.50	21 44	58.4	-14-24-4.8	5.9501	5.0292	8.6590	-1.55	33.04	0.999	-18.95
30 JAN 1988	6460.50	21 49	32.7	-14-0-46.3	5.9726	5.0278	6.9122	-1.54	32.92	0.999	-15.05
4 FEB 1988	6465.50	21 54	8.7	-13-36-58.1	5.9900	5.0265	5.1327	-1.54	32.82	1.000	-11.17
9 FEB 1988	6470.50	21 58	45.8	-13-12-43.7	6.0022	5.0252	3.3218	-1.53	32.76	1.000	-7.31
14 FEB 1988	6475.50	22 3	23.3	-12-48-7.7	6.0092	5.0238	1.5017	-1.53	32.72	1.000	-3.50
19 FEB 1988	6480.50	22 8	0.5	-12-23-14.0	6.0109	5.0225	-0.3089	-1.53	32.71	1.000	0.94
24 FEB 1988	6485.50	22 12	36.8	-11-58-6.8	6.0074	5.0212	-2.1020	-1.53	32.73	1.000	4.36
1 MAR 1988	6490.50	22 17	11.7	-11-32-50.2	5.9988	5.0199	-3.8802	-1.54	32.78	1.000	8.15
6 MAR 1988	6495.50	22 21	44.6	-11-7-27.5	5.9850	5.0187	-5.6517	-1.54	32.85	1.000	11.95
11 MAR 1988	6500.50	22 26	15.1	-10-42-3.9	5.9661	5.0174	-7.4064	-1.55	32.96	0.999	15.77
16 MAR 1988	6505.50	22 30	42.3	-10-16-43.9	5.9423	5.0161	-9.1209	-1.56	33.09	0.999	19.58
21 MAR 1988	6510.50	22 35	5.9	-9-51-32.4	5.9135	5.0149	-10.7826	-1.57	33.25	0.998	23.39
26 MAR 1988	6515.50	22 39	25.1	-9-26-34.2	5.8800	5.0137	-12.3894	-1.58	33.44	0.998	27.20
31 MAR 1988	6520.50	22 43	39.5	-9-1-53.2	5.8420	5.0124	-13.9488	-1.60	33.68	0.997	31.02
5 APR 1988	6525.50	22 47	48.7	-8-37-34.1	5.7995	5.0112	-15.4643	-1.61	33.90	0.997	34.84
10 APR 1988	6530.50	22 51	51.9	-8-13-42.5	5.7527	5.0100	-16.9179	-1.63	34.18	0.998	38.68
15 APR 1988	6535.50	22 55	48.6	-7-50-23.5	5.7019	5.0088	-18.2892	-1.65	34.48	0.995	42.54
20 APR 1988	6540.50	22 59	38.1	-7-27-42.3	5.6472	5.0076	-19.5714	-1.67	34.82	0.995	46.40
25 APR 1988	6545.50	23 3	19.8	-7-5-44.1	5.5889	5.0064	-20.7682	-1.70	35.18	0.994	50.29
30 APR 1988	6550.50	23 6	53.3	-6-44-32.9	5.5273	5.0053	-21.8876	-1.72	35.57	0.993	54.20
5 MAY 1988	6555.50	23 10	17.8	-6-24-14.8	5.4626	5.0041	-22.9240	-1.75	35.99	0.993	58.14
10 MAY 1988	6560.50	23 13	32.7	-6-4-55.3	5.3950	5.0030	-23.8551	-1.77	36.44	0.992	62.11
15 MAY 1988	6565.50	23 16	37.2	-5-46-40.0	5.3249	5.0018	-24.6649	-1.80	36.92	0.991	66.11
20 MAY 1988	6570.50	23 19	30.6	-5-29-34.6	5.2527	5.0007	-25.3518	-1.83	37.43	0.991	70.16
25 MAY 1988	6575.50	23 22	12.2	-5-13-43.6	5.1786	4.9996	-26.9233	-1.86	37.97	0.990	74.24
30 MAY 1988	6580.50	23 24	41.6	-4-59-12.1	5.1031	4.9985	-28.3821	-1.90	38.53	0.990	78.38
4 JUN 1988	6585.50	23 26	57.7	-4-46-6.1	5.0264	4.9974	-29.7127	-1.93	39.12	0.990	82.56
9 JUN 1988	6590.50	23 28	59.9	-4-34-30.9	4.9489	4.9963	-28.8928	-1.96	39.73	0.990	86.80
14 JUN 1988	6595.50	23 30	47.3	-4-24-31.9	4.8712	4.9953	-28.9112	-2.00	40.36	0.990	91.11
19 JUN 1988	6600.50	23 32	19.3	-4-16-13.5	4.7937	4.9942	-28.7724	-2.03	41.02	0.990	95.48
24 JUN 1988	6605.50	23 33	35.4	-4-9-38.9	4.7167	4.9932	-28.4848	-2.07	41.68	0.990	99.91
29 JUN 1988	6610.50	23 34	35.0	-4-4-52.5	4.6409	4.9922	-28.0420	-2.11	42.37	0.990	104.42
4 JUL 1988	6615.50	23 35	17.4	-4-1-57.7	4.5665	4.9911	-25.4244	-2.14	43.06	0.991	109.00
9 JUL 1988	6620.50	23 35	42.1	-4-0-57.3	4.4942	4.9901	-24.6155	-2.18	43.75	0.991	113.67
14 JUL 1988	6625.50	23 35	48.9	-4-1-52.7	4.4245	4.9891	-23.6143	-2.21	44.44	0.992	118.42
19 JUL 1988	6630.50	23 35	37.7	-4-4-43.0	4.3580	4.9882	-22.4352	-2.24	45.12	0.993	123.25

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6635.50	23 35	8.7	-4 -9-28.4	4.2951	4.9872	-21.0872	-2.28	45.78	0.994	128.16
29 JUL 1986	6640.50	23 34	22.0	-4-16 -0.9	4.2364	4.9862	-19.5615	-2.31	46.41	0.994	133.15
3 AUG 1986	6645.50	23 33	18.2	-4-24-22.0	4.1823	4.9853	-17.8488	-2.33	47.01	0.995	138.23
8 AUG 1986	6650.50	23 31	57.8	-4-34-23.5	4.1335	4.9844	-15.9508	-2.36	47.57	0.996	143.39
13 AUG 1986	6655.50	23 30	22.3	-4-45-58.2	4.0904	4.9834	-13.8892	-2.38	48.07	0.997	148.62
18 AUG 1986	6660.50	23 28	33.0	-4-58-48.1	4.0534	4.9825	-11.6953	-2.40	48.51	0.998	153.92
23 AUG 1986	6665.50	23 26	31.8	-5-12-47.2	4.0229	4.9816	-9.3841	-2.42	48.87	0.999	159.27
28 AUG 1986	6670.50	23 24	20.6	-5-27-39.6	3.9993	4.9807	-6.9603	-2.43	49.16	0.999	164.67
2 SEP 1986	6675.50	23 22	1.5	-5-43 -9.7	3.9828	4.9799	-4.4396	-2.44	49.37	1.000	170.10
7 SEP 1986	6680.50	23 19	37.2	-5-59 -0.3	3.9737	4.9790	-1.8517	-2.45	49.48	1.000	175.45
12 SEP 1986	6685.50	23 17	10.4	-6-14-52.5	3.9721	4.9782	0.7586	-2.45	49.50	1.000	-178.05
17 SEP 1986	6690.50	23 14	44.0	-6-30-28.1	3.9781	4.9773	3.3518	-2.45	49.42	1.000	-173.07
22 SEP 1986	6695.50	23 12	20.5	-6-45-30.4	3.9915	4.9765	5.9128	-2.44	49.26	1.000	-167.62
27 SEP 1986	6700.50	23 10	2.8	-6-59-43.1	4.0122	4.9757	8.4260	-2.43	49.00	0.999	-162.14
2 OCT 1986	6705.50	23 7	53.3	-7-12-51.1	4.0401	4.9749	10.8642	-2.41	48.67	0.998	-156.68
7 OCT 1986	6710.50	23 5	54.5	-7-24-39.8	4.0748	4.9741	13.1912	-2.40	48.25	0.998	-151.22
12 OCT 1986	6715.50	23 4	8.7	-7-34-58.6	4.1161	4.9734	15.3692	-2.37	47.77	0.997	-145.81
17 OCT 1986	6720.50	23 2	37.6	-7-43-32.4	4.1634	4.9726	17.3824	-2.35	47.22	0.996	-140.47
22 OCT 1986	6725.50	23 1	22.7	-7-50-20.0	4.2163	4.9719	19.2338	-2.32	46.63	0.995	-135.17
27 OCT 1986	6730.50	23 0	25.0	-7-55-14.1	4.2744	4.9711	20.9173	-2.29	46.00	0.994	-129.95
1 NOV 1986	6735.50	22 59	45.5	-7-58-10.8	4.3370	4.9704	22.4158	-2.26	45.33	0.993	-124.78
6 NOV 1986	6740.50	22 59	25.0	-7-59 -6.7	4.4036	4.9697	23.7091	-2.23	44.65	0.992	-119.69
11 NOV 1986	6745.50	22 59	23.6	-7-58 -1.8	4.4737	4.9690	24.7882	-2.20	43.95	0.992	-114.67
16 NOV 1986	6750.50	22 59	41.4	-7-54-57.4	4.5466	4.9684	25.6859	-2.16	43.24	0.991	-109.73
21 NOV 1986	6755.50	23 0	18.0	-7-49-55.5	4.6217	4.9677	26.3584	-2.13	42.54	0.991	-104.86
26 NOV 1986	6760.50	23 1	13.1	-7-42-59.3	4.6986	4.9671	26.8674	-2.09	41.85	0.990	-100.07
1 DEC 1986	6765.50	23 2	28.2	-7-34-11.4	4.7767	4.9664	27.1839	-2.05	41.16	0.990	-95.34
6 DEC 1986	6770.50	23 3	56.8	-7-23-36.1	4.8555	4.9658	27.3027	-2.02	40.49	0.990	-90.68
11 DEC 1986	6775.50	23 5	44.0	-7-11-15.8	4.9342	4.9652	27.2361	-1.98	39.85	0.990	-86.09
16 DEC 1986	6780.50	23 7	47.0	-6-57-18.3	5.0126	4.9646	27.0075	-1.95	39.22	0.990	-81.57
21 DEC 1986	6785.50	23 10	4.8	-6-41-47.9	5.0901	4.9640	26.6324	-1.92	38.63	0.991	-77.11
26 DEC 1986	6790.50	23 12	36.6	-6-24-49.8	5.1683	4.9634	26.1110	-1.89	38.06	0.991	-72.70
31 DEC 1986	6795.50	23 15	21.6	-6 -8-27.9	5.2407	4.9629	25.4365	-1.85	37.52	0.991	-68.36

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	23 18 18.9	-5-48-48.0	5.3130	4.9624	24.6149	-1.82	37.01	0.992		-64.08
10 JAN 1987	6805.50	23 21 27.4	-5-25-55.8	5.3828	4.9618	23.6685	-1.80	36.53	0.993		-59.83
15 JAN 1987	6810.50	23 24 46.3	-5-3-58.8	5.4498	4.9613	22.6181	-1.77	36.08	0.993		-55.64
20 JAN 1987	6815.50	23 28 14.7	-4-40-58.6	5.5133	4.9608	21.4737	-1.75	35.68	0.994		-51.49
25 JAN 1987	6820.50	23 31 51.8	-4-18-59.8	5.5738	4.9603	20.2308	-1.72	35.28	0.995		-47.40
30 JAN 1987	6825.50	23 35 37.0	-3-52-10.8	5.6301	4.9599	18.9853	-1.70	34.92	0.996		-43.34
4 FEB 1987	6830.50	23 39 29.3	-3-28-35.7	5.6825	4.9594	17.4530	-1.68	34.60	0.996		-39.32
9 FEB 1987	6835.50	23 43 27.9	-3-0-19.7	5.7308	4.9590	15.9572	-1.68	34.31	0.997		-35.34
14 FEB 1987	6840.50	23 47 32.1	-2-33-28.1	5.7747	4.9585	14.4122	-1.65	34.05	0.997		-31.39
19 FEB 1987	6845.50	23 51 41.2	-2-6-5.8	5.8140	4.9581	12.8215	-1.63	33.82	0.998		-27.48
24 FEB 1987	6850.50	23 55 54.7	-1-38-16.7	5.8487	4.9577	11.1770	-1.62	33.62	0.998		-23.60
1 MAR 1987	6855.50	0 0 11.9	-1-10-5.9	5.8785	4.9573	9.4805	-1.61	33.45	0.999		-19.75
6 MAR 1987	6860.50	0 4 32.2	0-41-38.6	5.9034	4.9570	7.7541	-1.60	33.31	0.999		-15.92
11 MAR 1987	6865.50	0 8 54.9	0-12-59.5	5.9233	4.9566	6.0163	-1.59	33.19	1.000		-12.13
16 MAR 1987	6870.50	0 13 19.3	0 15 46.3	5.9381	4.9563	4.2748	-1.59	33.11	1.000		-8.36
21 MAR 1987	6875.50	0 17 45.1	0 44 35.0	5.9480	4.9559	2.5267	-1.58	33.06	1.000		-4.66
26 MAR 1987	6880.50	0 22 11.8	1 13 22.9	5.9527	4.9556	0.7634	-1.58	33.03	1.000		-1.33
31 MAR 1987	6885.50	0 26 38.8	1 42 4.9	5.9524	4.9553	-1.0049	-1.58	33.03	1.000		3.15
5 APR 1987	6890.50	0 31 5.5	2 10 36.6	5.9469	4.9550	-2.7552	-1.58	33.06	1.000		6.77
10 APR 1987	6895.50	0 35 31.3	2 38 53.6	5.9365	4.9548	-4.4758	-1.59	33.12	1.000		10.45
15 APR 1987	6900.50	0 39 55.7	3 6 51.4	5.9211	4.9545	-6.1650	-1.59	33.21	0.999		14.15
20 APR 1987	6905.50	0 44 18.3	3 34 27.3	5.9009	4.9543	-7.8305	-1.60	33.32	0.999		17.84
25 APR 1987	6910.50	0 48 38.6	4 1 36.9	5.8759	4.9540	-9.4765	-1.61	33.46	0.999		21.54
30 APR 1987	6915.50	0 52 58.0	4 28 18.0	5.8462	4.9538	-11.0853	-1.62	33.63	0.998		25.24
5 MAY 1987	6920.50	0 57 9.9	4 54 20.6	5.8119	4.9536	-12.6371	-1.63	33.83	0.998		28.95
10 MAY 1987	6925.50	1 1 19.6	5 19 46.4	5.7733	4.9534	-14.1261	-1.65	34.06	0.997		32.67
15 MAY 1987	6930.50	1 5 24.7	5 44 30.0	5.7304	4.9533	-15.5558	-1.66	34.31	0.996		36.40
20 MAY 1987	6935.50	1 9 24.7	6 8 28.7	5.6835	4.9531	-16.9350	-1.68	34.59	0.996		40.14
25 MAY 1987	6940.50	1 13 18.8	6 31 38.0	5.6326	4.9530	-18.2591	-1.70	34.91	0.995		43.90
30 MAY 1987	6945.50	1 17 6.4	6 53 54.2	5.5781	4.9529	-19.5058	-1.72	35.25	0.994		47.69
4 JUN 1987	6950.50	1 20 48.8	7 15 13.3	5.5201	4.9527	-20.6599	-1.75	35.62	0.994		51.51
9 JUN 1987	6955.50	1 24 19.2	7 35 31.4	5.4589	4.9526	-21.7205	-1.77	36.02	0.993		55.35
14 JUN 1987	6960.50	1 27 43.1	7 54 46.2	5.3947	4.9526	-22.6944	-1.80	36.45	0.992		59.22
19 JUN 1987	6965.50	1 30 57.6	8 12 53.8	5.3279	4.9525	-23.5854	-1.82	36.90	0.992		63.14
24 JUN 1987	6970.50	1 34 1.9	8 29 50.3	5.2586	4.9524	-24.3788	-1.85	37.39	0.991		67.10
29 JUN 1987	6975.50	1 36 55.3	8 45 32.1	5.1872	4.9524	-25.0510	-1.88	37.90	0.990		71.11
4 JUL 1987	6980.50	1 39 38.7	8 59 55.1	5.1140	4.9524	-25.5919	-1.91	38.45	0.990		75.17
9 JUL 1987	6985.50	1 42 5.3	9 12 56.3	5.0395	4.9524	-26.0042	-1.94	39.01	0.990		79.29
14 JUL 1987	6990.50	1 44 20.6	9 24 33.3	4.9640	4.9524	-26.2946	-1.98	39.61	0.989		83.46
19 JUL 1987	6995.50	1 46 21.4	9 34 42.0	4.8878	4.9524	-26.4570	-2.01	40.23	0.989		87.70

GEOCENTRIC EPHEMERIS FOR JUPITER

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24 JUL 1987	7000.50	1 48	7.0	9 43 19.4	4.8113	4.9524	-26.4694	-2.04	40.87	0.989	92.02
29 JUL 1987	7005.50	1 49 36.4	9 50 21.8	4.7351	4.9525	4.9525	-26.3118	-2.08	41.52	0.990	96.41
3 AUG 1987	7010.50	1 50 48.9	9 55 46.3	4.6595	4.9525	4.9525	-25.9792	-2.11	42.20	0.990	100.88
8 AUG 1987	7015.50	1 51 43.9	9 59 31.7	4.5852	4.9526	4.9526	-25.4799	-2.15	42.88	0.990	105.44
13 AUG 1987	7020.50	1 52 20.8	10 1 36.1	4.5125	4.9527	4.9527	-24.8174	-2.18	43.57	0.991	110.07
18 AUG 1987	7025.50	1 52 39.2	10 1 57.7	4.4420	4.9528	4.9528	-23.9773	-2.22	44.26	0.991	114.80
23 AUG 1987	7030.50	1 52 38.5	10 0 35.6	4.3742	4.9529	4.9529	-22.9407	-2.25	44.95	0.992	119.82
28 AUG 1987	7035.50	1 52 18.8	9 57 29.6	4.3097	4.9531	4.9531	-21.6987	-2.28	45.62	0.993	124.54
2 SEP 1987	7040.50	1 51 40.1	9 52 41.8	4.2491	4.9532	4.9532	-20.2607	-2.31	46.27	0.994	129.55
7 SEP 1987	7045.50	1 50 43.0	9 46 15.7	4.1929	4.9534	4.9534	-18.6459	-2.34	46.89	0.995	134.64
12 SEP 1987	7050.50	1 49 28.2	9 38 15.1	4.1416	4.9536	4.9536	-16.8588	-2.37	47.47	0.996	139.83
17 SEP 1987	7055.50	1 47 56.7	9 28 45.8	4.0957	4.9537	4.9537	-14.8925	-2.39	48.01	0.997	145.10
22 SEP 1987	7060.50	1 46 9.7	9 17 54.7	4.0557	4.9540	4.9540	-12.7492	-2.41	48.48	0.997	150.45
27 SEP 1987	7065.50	1 44 8.9	9 5 51.7	4.0222	4.9542	4.9542	-10.4468	-2.43	48.88	0.998	155.88
2 OCT 1987	7070.50	1 41 56.7	8 52 49.4	3.9955	4.9544	4.9544	-8.0215	-2.45	49.21	0.999	161.38
7 OCT 1987	7075.50	1 39 35.3	8 39 1.2	3.9760	4.9547	4.9547	-5.5081	-2.46	49.45	0.999	166.88
12 OCT 1987	7080.50	1 37 7.3	8 24 41.5	3.9638	4.9549	4.9549	-2.9207	-2.46	49.60	1.000	172.40
17 OCT 1987	7085.50	1 34 35.4	8 10 6.1	3.9591	4.9552	4.9552	-0.2742	-2.47	49.68	1.000	177.59
22 OCT 1987	7090.50	1 32 2.5	7 55 31.2	3.9622	4.9555	4.9555	2.4018	-2.48	49.62	1.000	-175.86
27 OCT 1987	7095.50	1 29 31.7	7 41 15.3	3.9730	4.9558	4.9558	5.0654	-2.48	49.49	1.000	-170.39
1 NOV 1987	7100.50	1 27 5.9	7 27 36.2	3.9914	4.9561	4.9561	7.6683	-2.45	49.26	0.999	-164.80
6 NOV 1987	7105.50	1 24 47.9	7 14 49.6	4.0172	4.9565	4.9565	10.1815	-2.43	48.94	0.999	-159.21
11 NOV 1987	7110.50	1 22 40.2	7 3 10.5	4.0501	4.9568	4.9568	12.5958	-2.42	48.55	0.998	-153.65
16 NOV 1987	7115.50	1 20 44.9	6 52 51.7	4.0898	4.9572	4.9572	14.8922	-2.40	48.07	0.997	-148.12
21 NOV 1987	7120.50	1 19 4.1	6 44 5.3	4.1360	4.9576	4.9576	17.0423	-2.37	47.54	0.996	-142.64
26 NOV 1987	7125.50	1 17 39.6	6 37 2.1	4.1881	4.9580	4.9580	19.0133	-2.34	46.95	0.995	-137.22
1 DEC 1987	7130.50	1 16 32.6	6 31 49.1	4.2456	4.9584	4.9584	20.7827	-2.31	46.31	0.994	-131.87
6 DEC 1987	7135.50	1 15 44.1	6 28 31.1	4.3079	4.9588	4.9588	22.3531	-2.28	45.64	0.994	-126.60
11 DEC 1987	7140.50	1 15 14.6	6 27 10.9	4.3745	4.9592	4.9592	23.7333	-2.25	44.95	0.993	-121.40
16 DEC 1987	7145.50	1 15 4.4	6 27 49.3	4.4448	4.9597	4.9597	24.9175	-2.21	44.23	0.992	-116.28
21 DEC 1987	7150.50	1 15 13.7	6 30 26.9	4.5182	4.9601	4.9601	25.8923	-2.18	43.52	0.991	-111.25
26 DEC 1987	7155.50	1 15 42.5	6 35 2.2	4.5941	4.9606	4.9606	26.6473	-2.14	42.80	0.991	-106.29
31 DEC 1987	7160.50	1 16 30.3	6 41 31.3	4.6719	4.9611	4.9611	27.1905	-2.10	42.08	0.990	-101.42

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	7165.50	1 17 36.6	6 49 49.8	4.7510	4.9616	27.5439	-2.07	41.38	0.990		-96.64
10 JAN 1988	7170.50	1 19 01.6	6 59 52.1	4.8308	4.9621	27.7222	-2.03	40.70	0.990		-91.93
15 JAN 1988	7175.50	1 20 41.7	7 11 32.7	4.9109	4.9627	27.7244	-2.00	40.04	0.990		-87.30
20 JAN 1988	7180.50	1 22 39.3	7 24 46.6	4.9908	4.9632	27.5443	-1.96	39.40	0.990		-82.74
25 JAN 1988	7185.50	1 24 52.6	7 39 26.9	5.0698	4.9638	27.1872	-1.93	38.78	0.990		-78.25
30 JAN 1988	7190.50	1 27 20.5	7 55 26.5	5.1477	4.9643	26.6755	-1.89	38.20	0.991		-73.84
4 FEB 1988	7195.50	1 30 2.2	8 12 38.3	5.2238	4.9649	26.0318	-1.86	37.64	0.991		-69.49
9 FEB 1988	7200.50	1 32 56.7	8 30 55.3	5.2979	4.9655	25.2662	-1.83	37.11	0.992		-65.20
14 FEB 1988	7205.50	1 36 3.4	8 50 11.5	5.3696	4.9661	24.3748	-1.80	36.62	0.992		-60.98
19 FEB 1988	7210.50	1 39 21.4	9 10 20.6	5.4385	4.9668	23.3549	-1.77	36.15	0.993		-56.81
24 FEB 1988	7215.50	1 42 49.9	9 31 15.4	5.5044	4.9674	22.2222	-1.75	35.72	0.994		-52.70
29 FEB 1988	7220.50	1 46 28.0	9 52 49.6	5.5688	4.9681	21.0009	-1.72	35.32	0.994		-48.64
5 MAR 1988	7225.50	1 50 14.9	10 14 56.3	5.6256	4.9687	19.7065	-1.70	34.95	0.995		-44.63
10 MAR 1988	7230.50	1 54 9.9	10 37 29.9	5.6805	4.9694	18.3423	-1.68	34.61	0.996		-40.66
15 MAR 1988	7235.50	1 58 12.4	11 0 25.6	5.7314	4.9701	16.9007	-1.66	34.30	0.996		-36.74
20 MAR 1988	7240.50	2 2 21.7	11 23 37.3	5.7781	4.9708	15.3842	-1.64	34.03	0.997		-32.85
25 MAR 1988	7245.50	2 6 37.0	11 46 59.7	5.8202	4.9716	13.8147	-1.62	33.78	0.998		-29.00
30 MAR 1988	7250.50	2 10 57.7	12 10 27.4	5.8578	4.9723	12.2113	-1.61	33.56	0.998		-25.19
4 APR 1988	7255.50	2 16 23.1	12 33 55.0	5.8907	4.9730	10.5818	-1.60	33.38	0.999		-21.41
9 APR 1988	7260.50	2 19 52.7	12 57 19.0	5.9189	4.9738	8.9230	-1.59	33.22	0.999		-17.66
14 APR 1988	7265.50	2 24 25.9	13 20 35.1	5.9422	4.9746	7.2265	-1.58	33.09	0.999		-13.94
19 APR 1988	7270.50	2 29 2.2	13 43 38.7	5.9606	4.9754	5.5027	-1.57	32.99	1.000		-10.24
24 APR 1988	7275.50	2 33 40.9	14 6 26.2	5.9740	4.9762	3.7741	-1.56	32.91	1.000		-6.57
29 APR 1988	7280.50	2 38 21.4	14 28 53.0	5.9824	4.9770	2.0525	-1.56	32.87	1.000		-2.98
4 MAY 1988	7285.50	2 43 3.1	14 50 58.0	5.9859	4.9778	0.3396	-1.56	32.85	1.000		1.23
9 MAY 1988	7290.50	2 47 45.6	15 12 32.8	5.9844	4.9786	-1.3726	-1.56	32.85	1.000		4.56
14 MAY 1988	7295.50	2 52 28.2	15 33 39.9	5.9780	4.9795	-3.0886	-1.56	32.89	1.000		8.16
19 MAY 1988	7300.50	2 57 10.5	15 54 14.6	5.9668	4.9804	-4.7906	-1.57	32.95	1.000		11.78
24 MAY 1988	7305.50	3 1 51.7	16 14 14.0	5.9503	4.9812	-6.4592	-1.57	33.04	0.999		15.41
29 MAY 1988	7310.50	3 6 31.2	16 33 35.3	5.9293	4.9821	-8.0892	-1.58	33.16	0.999		19.04
3 JUN 1988	7315.50	3 11 8.5	16 52 17.0	5.9036	4.9830	-9.6837	-1.59	33.30	0.998		22.67
8 JUN 1988	7320.50	3 15 43.0	17 10 17.3	5.8734	4.9840	-11.2519	-1.60	33.48	0.998		26.32
13 JUN 1988	7325.50	3 20 14.1	17 27 34.2	5.8387	4.9849	-12.7898	-1.61	33.67	0.997		29.98
18 JUN 1988	7330.50	3 24 41.0	17 44 6.1	5.7996	4.9858	-14.2751	-1.62	33.90	0.997		33.66
23 JUN 1988	7335.50	3 29 2.8	17 59 51.2	5.7563	4.9868	-15.6934	-1.64	34.16	0.996		37.36
28 JUN 1988	7340.50	3 33 19.1	18 14 48.2	5.7090	4.9877	-17.0439	-1.66	34.44	0.995		41.09
3 JUL 1988	7345.50	3 37 29.0	18 28 57.0	5.6579	4.9887	-18.3330	-1.68	34.75	0.995		44.83
8 JUL 1988	7350.50	3 41 31.8	18 42 16.2	5.6032	4.9897	-19.5654	-1.70	35.09	0.994		48.61
13 JUL 1988	7355.50	3 45 26.7	18 54 45.4	5.5450	4.9907	-20.7270	-1.72	35.46	0.993		52.43
18 JUL 1988	7360.50	3 49 12.8	19 6 23.7	5.4836	4.9917	-21.7943	-1.74	35.86	0.993		56.29

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	3 52	49.0	19 17	10.3	4.9927	-22.7575	-1.77	36.28	0.992	60.19
28 JUL 1988	7370.50	3 56	14.6	19 27	5.7	4.9938	-23.6191	-1.80	36.74	0.992	64.14
2 AUG 1988	7375.50	3 59	28.8	19 36	9.8	4.9948	-24.3552	-1.82	37.22	0.991	68.15
7 AUG 1988	7380.50	4 2	30.4	19 44	22.3	4.9959	-25.0508	-1.85	37.73	0.991	72.21
12 AUG 1988	7385.50	4 5	18.6	19 51	43.5	4.9969	-25.5932	-1.88	38.26	0.990	76.33
17 AUG 1988	7390.50	4 7	52.2	19 58	12.9	4.9980	-26.9914	-1.91	38.83	0.990	80.53
22 AUG 1988	7395.50	4 10	10.1	20 3	50.7	4.9884	-26.2395	-1.95	39.41	0.990	84.79
27 AUG 1988	7400.50	4 12	11.6	20 8	37.8	4.9124	-26.3430	-1.98	40.02	0.990	89.13
1 SEP 1988	7405.50	4 13	55.7	20 12	34.1	4.8364	-26.3032	-2.01	40.65	0.990	93.55
6 SEP 1988	7410.50	4 15	21.5	20 15	39.7	4.7808	-26.1044	-2.05	41.30	0.990	98.05
11 SEP 1988	7415.50	4 16	28.0	20 17	54.8	4.6858	-25.7225	-2.08	41.96	0.990	102.64
16 SEP 1988	7420.50	4 17	14.4	20 19	18.7	4.6123	-25.1431	-2.11	42.63	0.991	107.33
21 SEP 1988	7425.50	4 17	40.3	20 19	52.3	4.5407	-24.3689	-2.15	43.30	0.991	112.11
26 SEP 1988	7430.50	4 17	46.2	20 19	36.0	4.4717	-23.4104	-2.18	43.97	0.992	116.99
1 OCT 1988	7435.50	4 17	29.1	20 18	29.5	4.4057	-22.2649	-2.21	44.63	0.993	121.96
6 OCT 1988	7440.50	4 16	51.7	20 16	33.5	4.3433	-20.9161	-2.24	45.27	0.994	127.03
11 OCT 1988	7445.50	4 15	53.4	20 13	47.9	4.2851	-19.3538	-2.27	45.88	0.995	132.20
16 OCT 1988	7450.50	4 14	34.9	20 10	13.8	4.2317	-17.5827	-2.30	46.46	0.995	137.47
21 OCT 1988	7455.50	4 12	57.4	20 5	53.5	4.1838	-15.6266	-2.32	47.00	0.996	142.82
26 OCT 1988	7460.50	4 11	2.3	20 0	48.9	4.1416	-13.5090	-2.34	47.47	0.997	148.25
31 OCT 1988	7465.50	4 8	51.6	19 55	3.4	4.1059	-11.2348	-2.36	47.89	0.998	153.76
5 NOV 1988	7470.50	4 6	27.1	19 48	40.8	4.0769	-8.8092	-2.38	48.23	0.999	159.34
10 NOV 1988	7475.50	4 3	51.4	19 41	45.9	4.0551	-6.2531	-2.39	48.49	0.999	164.97
15 NOV 1988	7480.50	4 1	7.8	19 34	26.3	4.0409	-3.6033	-2.39	48.66	1.000	170.64
20 NOV 1988	7485.50	3 58	19.1	19 26	49.7	4.0344	-0.9982	-2.40	48.74	1.000	176.27
25 NOV 1988	7490.50	3 55	28.9	19 19	4.7	4.0357	1.7995	-2.40	48.72	1.000	-177.62
30 NOV 1988	7495.50	3 52	40.3	19 11	20.9	4.0448	4.5047	-2.39	48.61	1.000	-172.05
5 DEC 1988	7500.50	3 49	58.3	19 3	47.8	4.0616	7.1813	-2.38	48.41	0.999	-166.35
10 DEC 1988	7505.50	3 47	20.3	18 56	35.9	4.0862	9.7913	-2.37	48.12	0.999	-160.66
15 DEC 1988	7510.50	3 44	55.3	18 49	58.2	4.1181	12.2902	-2.35	47.74	0.998	-155.00
20 DEC 1988	7515.50	3 42	43.7	18 43	57.7	4.1570	14.6404	-2.33	47.30	0.998	-149.39
25 DEC 1988	7520.50	3 40	48.0	18 38	49.3	4.2025	16.8316	-2.30	46.79	0.997	-143.83
30 DEC 1988	7525.50	3 39	9.6	18 34	37.9	4.2541	18.8604	-2.28	46.22	0.996	-138.35

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1989	7530.50	3 37 50.1	18 31 29.1	4.3112	5.0327	20.7102	-2.25	45.61	0.995	-132.93
9 JAN 1989	7535.50	3 36 50.7	18 29 28.4	4.3735	5.0341	22.3578	-2.22	44.96	0.994	-127.60
14 JAN 1989	7540.50	3 36 12.1	18 28 38.9	4.4402	5.0355	23.7835	-2.18	44.28	0.993	-122.38
19 JAN 1989	7545.50	3 35 54.8	18 29 1.8	4.5106	5.0369	24.9862	-2.15	43.59	0.992	-117.20
24 JAN 1989	7550.50	3 35 58.7	18 30 37.1	4.5843	5.0383	25.9833	-2.11	42.89	0.992	-112.14
29 JAN 1989	7555.50	3 36 23.5	18 33 22.9	4.6605	5.0397	26.7850	-2.08	42.19	0.991	-107.16
3 FEB 1989	7560.50	3 37 9.0	18 37 17.5	4.7388	5.0411	27.3869	-2.04	41.49	0.991	-102.28
8 FEB 1989	7565.50	3 38 14.7	18 42 18.0	4.8185	5.0426	27.7807	-2.00	40.80	0.991	-97.48
13 FEB 1989	7570.50	3 39 40.0	18 48 19.9	4.8990	5.0440	27.9694	-1.97	40.13	0.990	-92.77
18 FEB 1989	7575.50	3 41 24.0	18 55 18.8	4.9798	5.0454	27.9742	-1.93	39.48	0.990	-88.15
23 FEB 1989	7580.50	3 43 25.7	19 3 8.8	5.0604	5.0469	27.8182	-1.89	38.85	0.990	-83.61
28 FEB 1989	7585.50	3 45 44.3	19 11 44.4	5.1404	5.0484	27.5112	-1.86	38.25	0.991	-79.15
5 MAR 1989	7590.50	3 48 19.1	19 21 0.6	5.2192	5.0499	27.0495	-1.83	37.67	0.991	-74.76
10 MAR 1989	7595.50	3 51 8.9	19 30 51.6	5.2964	5.0513	26.4312	-1.79	37.12	0.991	-70.44
15 MAR 1989	7600.50	3 54 13.1	19 41 11.2	5.3717	5.0528	25.6718	-1.76	36.60	0.992	-66.20
20 MAR 1989	7605.50	3 57 30.4	19 51 53.8	5.4446	5.0543	24.7965	-1.73	36.11	0.992	-62.02
25 MAR 1989	7610.50	4 0 59.9	20 2 53.2	5.5148	5.0558	23.8219	-1.70	35.65	0.993	-57.90
30 MAR 1989	7615.50	4 4 40.8	20 14 4.4	5.5821	5.0574	22.7513	-1.68	35.22	0.994	-53.83
4 APR 1989	7620.50	4 8 32.3	20 25 22.6	5.6461	5.0589	21.5777	-1.65	34.82	0.994	-49.82
9 APR 1989	7625.50	4 12 33.7	20 36 42.1	5.7066	5.0604	20.3046	-1.63	34.45	0.995	-45.86
14 APR 1989	7630.50	4 16 43.9	20 47 58.8	5.7633	5.0620	18.9538	-1.61	34.12	0.996	-41.95
19 APR 1989	7635.50	4 21 2.2	20 59 7.5	5.8160	5.0635	17.5453	-1.58	33.81	0.996	-38.09
24 APR 1989	7640.50	4 25 27.6	21 10 4.1	5.8646	5.0651	16.0873	-1.57	33.53	0.997	-34.26
29 APR 1989	7645.50	4 29 59.7	21 20 45.3	5.9089	5.0666	14.5764	-1.55	33.27	0.997	-30.46
4 MAY 1989	7650.50	4 34 37.7	21 31 7.2	5.9487	5.0682	13.0048	-1.53	33.05	0.998	-26.70
9 MAY 1989	7655.50	4 39 20.8	21 41 6.7	5.9839	5.0698	11.3832	-1.52	32.86	0.998	-22.97
14 MAY 1989	7660.50	4 44 8.4	21 50 40.9	6.0144	5.0713	9.7342	-1.51	32.69	0.999	-19.27
19 MAY 1989	7665.50	4 48 59.6	21 59 46.6	6.0401	5.0729	8.0699	-1.50	32.55	0.999	-15.59
24 MAY 1989	7670.50	4 53 53.8	22 8 21.9	6.0610	5.0745	6.3920	-1.49	32.44	1.000	-11.92
29 MAY 1989	7675.50	4 58 50.5	22 18 25.2	6.0770	5.0761	4.6924	-1.48	32.35	1.000	-8.28
3 JUN 1989	7680.50	5 3 49.0	22 23 54.2	6.0881	5.0777	2.9670	-1.48	32.30	1.000	-4.65
8 JUN 1989	7685.50	5 8 48.0	22 30 48.1	6.0942	5.0794	1.2336	-1.48	32.26	1.000	-1.08
13 JUN 1989	7690.50	5 13 48.6	22 37 5.4	6.0952	5.0810	-0.4885	-1.48	32.26	1.000	2.65
18 JUN 1989	7695.50	5 18 48.3	22 42 45.3	6.0914	5.0826	-2.1939	-1.48	32.28	1.000	6.25
23 JUN 1989	7700.50	5 23 47.2	22 47 47.8	6.0826	5.0842	-3.8859	-1.48	32.32	1.000	9.86
28 JUN 1989	7705.50	5 28 44.6	22 52 12.6	6.0689	5.0859	-5.5737	-1.48	32.40	0.999	13.48
3 JUL 1989	7710.50	5 33 39.9	22 55 59.6	6.0504	5.0875	-7.2631	-1.49	32.50	0.999	17.12
8 JUL 1989	7715.50	5 38 32.4	22 59 9.9	6.0271	5.0892	-8.9017	-1.50	32.62	0.999	20.76
13 JUL 1989	7720.50	5 43 21.1	23 1 43.6	5.9990	5.0908	-10.5058	-1.51	32.77	0.998	24.42
18 JUL 1989	7725.50	5 48 5.7	23 3 42.1	5.9664	5.0925	-12.0641	-1.52	32.95	0.998	28.10

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1989	7730.50	5 52	45.2	23 5	7.0	5.9294	-13.5831	-1.53	33.16	0.997	31.80
28 JUL 1989	7735.50	5 57	19.2	23 5	59.5	5.8880	-15.0681	-1.54	33.39	0.997	35.52
2 AUG 1989	7740.50	6 1	46.8	23 6	22.0	5.8424	-16.5045	-1.58	33.65	0.996	39.28
7 AUG 1989	7745.50	6 6	7.0	23 6	16.0	5.7928	-17.8691	-1.58	33.94	0.995	43.07
12 AUG 1989	7750.50	6 10	19.2	23 5	45.5	5.7393	-19.1528	-1.60	34.26	0.995	46.90
17 AUG 1989	7755.50	6 14	22.5	23 4	52.1	5.6822	-20.3578	-1.62	34.60	0.994	50.77
22 AUG 1989	7760.50	6 18	16.1	23 3	39.0	5.6218	-21.4900	-1.64	34.97	0.993	54.68
27 AUG 1989	7765.50	6 21	59.2	23 2	9.3	5.5582	-22.5449	-1.66	35.37	0.993	58.65
1 SEP 1989	7770.50	6 25	30.8	23 0	27.0	5.4917	-23.4998	-1.69	35.80	0.992	62.67
6 SEP 1989	7775.50	6 28	49.9	22 58	35.2	5.4226	-24.3334	-1.72	36.26	0.992	66.75
11 SEP 1989	7780.50	6 31	55.6	22 56	38.0	5.3512	-25.0404	-1.75	36.74	0.991	70.90
16 SEP 1989	7785.50	6 34	47.0	22 54	39.5	5.2781	-25.6250	-1.77	37.25	0.991	75.10
21 SEP 1989	7790.50	6 37	23.1	22 52	42.7	5.2034	-26.0880	-1.80	37.79	0.991	79.38
26 SEP 1989	7795.50	6 39	43.1	22 50	52.4	5.1275	-26.4135	-1.84	38.35	0.990	83.74
1 OCT 1989	7800.50	6 41	45.8	22 49	12.0	5.0510	-26.5754	-1.87	38.93	0.990	88.18
6 OCT 1989	7805.50	6 43	30.2	22 47	45.1	4.9742	-26.5676	-1.90	39.53	0.990	92.70
11 OCT 1989	7810.50	6 44	55.5	22 46	35.4	4.8978	-26.3604	-1.93	40.14	0.991	97.31
16 OCT 1989	7815.50	6 46	1.1	22 45	45.4	4.8221	-25.9900	-1.97	40.77	0.991	102.01
21 OCT 1989	7820.50	6 46	46.2	22 45	17.5	4.7478	-25.4400	-2.00	41.41	0.991	106.80
26 OCT 1989	7825.50	6 47	10.2	22 45	14.1	4.6754	-24.6894	-2.03	42.05	0.992	111.69
31 OCT 1989	7830.50	6 47	12.5	22 45	36.0	4.6054	-23.7205	-2.06	42.69	0.992	116.67
5 NOV 1989	7835.50	6 46	53.1	22 46	23.9	4.5386	-22.5305	-2.09	43.32	0.993	121.76
10 NOV 1989	7840.50	6 46	12.0	22 47	37.4	4.4755	-21.1339	-2.12	43.93	0.994	126.93
15 NOV 1989	7845.50	6 45	9.8	22 49	14.3	4.4167	-19.5441	-2.15	44.52	0.995	132.20
20 NOV 1989	7850.50	6 43	47.0	22 51	13.2	4.3628	-17.7566	-2.18	45.07	0.996	137.56
25 NOV 1989	7855.50	6 42	4.6	22 53	30.9	4.3144	-16.7857	-2.20	45.57	0.997	143.01
30 NOV 1989	7860.50	6 40	4.1	22 56	3.4	4.2720	-13.5803	-2.22	46.02	0.997	148.54
5 DEC 1989	7865.50	6 37	47.4	22 58	46.8	4.2361	-11.2270	-2.24	46.41	0.998	154.13
10 DEC 1989	7870.50	6 35	16.9	23 1	35.9	4.2073	-8.7455	-2.25	46.73	0.999	159.79
15 DEC 1989	7875.50	6 32	35.3	23 4	26.2	4.1857	-6.1624	-2.26	46.97	0.999	165.49
20 DEC 1989	7880.50	6 29	45.4	23 7	13.6	4.1717	-3.4894	-2.27	47.13	1.000	171.23
25 DEC 1989	7885.50	6 26	50.2	23 9	53.8	4.1656	-0.7503	-2.27	47.20	1.000	177.00
30 DEC 1989	7890.50	6 23	53.3	23 12	23.9	4.1674	2.0162	-2.27	47.18	1.000	-177.22

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	6 20	58.0	23 14	41.6	4.1772	5.1517	-2.27	47.07	1.000	-171.45
9 JAN 1990	7900.50	6 18	8.1	23 16	44.9	4.1949	5.1535	-2.26	46.87	0.999	-165.71
14 JAN 1990	7905.50	6 15	28.4	23 18	34.2	4.2201	5.1553	-2.24	46.59	0.999	-159.99
19 JAN 1990	7910.50	6 12	55.8	23 20	9.4	4.2527	5.1671	-2.22	46.23	0.998	-154.33
24 JAN 1990	7915.50	6 10	39.2	23 21	31.7	4.2923	5.1589	-2.20	45.81	0.998	-148.72
29 JAN 1990	7920.50	6 8	38.7	23 22	43.1	4.3385	5.1607	-2.18	45.32	0.997	-143.17
3 FEB 1990	7925.50	6 6	58.5	23 23	44.7	4.3908	5.1625	-2.15	44.78	0.998	-137.70
8 FEB 1990	7930.50	6 5	34.0	23 24	38.8	4.4485	5.1643	-2.12	44.20	0.995	-132.32
13 FEB 1990	7935.50	6 4	32.1	23 25	27.2	4.5112	5.1661	-2.09	43.58	0.994	-127.02
18 FEB 1990	7940.50	6 3	51.6	23 26	10.8	4.5782	5.1679	-2.06	42.95	0.993	-121.82
23 FEB 1990	7945.50	6 3	32.8	23 26	51.0	4.6490	5.1697	-2.03	42.29	0.993	-116.71
28 FEB 1990	7950.50	6 3	35.9	23 27	28.2	4.7230	5.1715	-1.99	41.63	0.992	-111.69
5 MAR 1990	7955.50	6 4	0.7	23 28	1.8	4.7994	5.1734	-1.96	40.97	0.992	-106.77
10 MAR 1990	7960.50	6 4	48.7	23 28	32.0	4.8778	5.1752	-1.92	40.31	0.991	-101.94
15 MAR 1990	7965.50	6 5	53.1	23 28	57.2	4.9574	5.1770	-1.88	39.66	0.991	-97.21
20 MAR 1990	7970.50	6 7	19.3	23 29	16.1	5.0379	5.1788	-1.85	39.03	0.991	-92.56
25 MAR 1990	7975.50	6 9	4.5	23 29	27.2	5.1187	5.1806	-1.81	38.41	0.991	-88.00
30 MAR 1990	7980.50	6 11	7.7	23 29	27.9	5.1993	5.1824	-1.78	37.82	0.991	-83.52
4 APR 1990	7985.50	6 13	28.1	23 29	16.3	5.2792	5.1843	-1.74	37.24	0.991	-79.12
9 APR 1990	7990.50	6 16	4.4	23 28	50.1	5.3578	5.1861	-1.71	36.70	0.991	-74.80
14 APR 1990	7995.50	6 18	55.6	23 28	6.4	5.4349	5.1879	-1.68	36.18	0.992	-70.55
19 APR 1990	8000.50	6 22	0.7	23 27	3.4	5.5101	5.1897	-1.65	35.68	0.992	-66.37
24 APR 1990	8005.50	6 25	18.7	23 25	38.3	5.5831	5.1915	-1.62	35.22	0.993	-62.25
29 APR 1990	8010.50	6 28	48.8	23 23	48.7	5.6533	5.1934	-1.59	34.78	0.993	-58.18
4 MAY 1990	8015.50	6 32	29.9	23 21	32.9	5.7208	5.1962	-1.56	34.37	0.994	-54.18
9 MAY 1990	8020.50	6 36	20.8	23 18	48.7	5.7847	5.1970	-1.54	33.99	0.994	-50.22
14 MAY 1990	8025.50	6 40	20.7	23 15	34.3	5.8453	5.1988	-1.52	33.64	0.995	-46.31
19 MAY 1990	8030.50	6 44	28.8	23 11	48.4	5.9022	5.2006	-1.49	33.31	0.996	-42.44
24 MAY 1990	8035.50	6 48	44.3	23 7	29.1	5.9552	5.2025	-1.47	33.02	0.996	-38.61
29 MAY 1990	8040.50	6 53	6.3	23 2	35.7	6.0041	5.2043	-1.46	32.75	0.997	-34.82
3 JUN 1990	8045.50	6 57	34.0	22 57	7.5	6.0486	5.2061	-1.44	32.51	0.997	-31.06
8 JUN 1990	8050.50	7 2	6.4	22 51	3.7	6.0887	5.2079	-1.42	32.29	0.998	-27.32
13 JUN 1990	8055.50	7 6	43.0	22 44	24.3	6.1243	5.2097	-1.41	32.10	0.998	-23.61
18 JUN 1990	8060.50	7 11	23.0	22 37	8.9	6.1553	5.2115	-1.40	31.94	0.999	-19.92
23 JUN 1990	8065.50	7 16	5.8	22 29	17.5	6.1814	5.2133	-1.39	31.81	0.999	-16.24
28 JUN 1990	8070.50	7 20	50.7	22 20	51.3	6.2028	5.2152	-1.38	31.70	1.000	-12.58
3 JUL 1990	8075.50	7 25	36.8	22 11	50.7	6.2189	5.2170	-1.37	31.62	1.000	-8.92
8 JUL 1990	8080.50	7 30	23.6	22 2	16.9	6.2303	5.2188	-1.37	31.56	1.000	-5.28
13 JUL 1990	8085.50	7 35	10.5	21 52	11.4	6.2368	5.2206	-1.37	31.53	1.000	-1.64
18 JUL 1990	8090.50	7 39	56.9	21 41	35.0	6.2379	5.2224	-1.37	31.52	1.000	2.03

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	7 44	42.2	21 30	30.1	6.2342	-2.1718	-1.37	31.54	1.0000	5.68
28 JUL 1990	8100.50	7 49	25.6	21 18	58.9	6.2254	-3.9175	-1.37	31.58	1.0000	9.34
2 AUG 1990	8105.50	7 54	6.6	21 7	3.8	6.2116	-5.6383	-1.37	31.65	1.0000	13.01
7 AUG 1990	8110.50	7 58	44.6	20 54	47.6	6.1929	-7.3336	-1.38	31.75	0.999	16.70
12 AUG 1990	8115.50	8 3	18.8	20 42	13.1	6.1693	-9.0092	-1.39	31.87	0.999	20.40
17 AUG 1990	8120.50	8 7	49.0	20 29	22.8	6.1408	-10.6702	-1.40	32.02	0.998	24.13
22 AUG 1990	8125.50	8 12	14.3	20 16	21.2	6.1077	-12.3016	-1.41	32.19	0.998	27.88
27 AUG 1990	8130.50	8 16	34.0	20 3	11.6	6.0698	-13.8798	-1.42	32.39	0.997	31.67
1 SEP 1990	8135.50	8 20	47.4	19 49	58.4	6.0276	-15.3968	-1.43	32.62	0.997	35.48
6 SEP 1990	8140.50	8 24	53.9	19 36	45.9	5.9810	-16.8546	-1.45	32.87	0.996	39.33
11 SEP 1990	8145.50	8 28	53.0	19 23	37.8	5.9303	-18.2587	-1.47	33.15	0.996	43.22
16 SEP 1990	8150.50	8 32	43.9	19 10	39.3	5.8756	-19.6048	-1.49	33.46	0.995	47.15
21 SEP 1990	8155.50	8 36	25.7	18 57	55.8	5.8171	-20.8933	-1.51	33.80	0.994	51.14
26 SEP 1990	8160.50	8 39	57.7	18 45	32.4	5.7552	-22.0315	-1.53	34.16	0.994	55.17
1 OCT 1990	8165.50	8 43	19.2	18 33	34.9	5.6900	-23.0870	-1.55	34.55	0.993	59.26
6 OCT 1990	8170.50	8 46	29.2	18 22	8.4	5.6219	-24.0394	-1.56	34.97	0.993	63.40
11 OCT 1990	8175.50	8 49	27.3	18 11	18.2	5.5512	-24.8890	-1.61	35.42	0.992	67.61
16 OCT 1990	8180.50	8 52	12.3	18 1	10.9	5.4783	-25.6200	-1.63	35.89	0.992	71.89
21 OCT 1990	8185.50	8 54	43.5	17 51	52.4	5.4034	-26.2052	-1.66	36.39	0.991	76.24
26 OCT 1990	8190.50	8 58	59.9	17 43	28.5	5.3271	-26.6291	-1.69	36.91	0.991	80.66
31 OCT 1990	8195.50	8 59	0.6	17 36	5.3	5.2498	-26.8914	-1.72	37.45	0.991	85.15
5 NOV 1990	8200.50	9 0	45.1	17 29	47.2	5.1719	-26.9863	-1.76	38.02	0.991	89.73
10 NOV 1990	8205.50	9 2	12.5	17 24	39.7	5.0940	-26.9359	-1.79	38.60	0.991	94.39
15 NOV 1990	8210.50	9 3	21.8	17 20	47.9	5.0165	-26.8870	-1.82	39.19	0.991	99.13
20 NOV 1990	8215.50	9 4	12.6	17 18	15.6	4.9401	-26.8287	-1.85	39.80	0.992	103.97
25 NOV 1990	8220.50	9 4	44.1	17 17	6.6	4.8653	-26.5553	-1.89	40.41	0.992	108.90
30 NOV 1990	8225.50	9 4	56.0	17 17	22.3	4.7927	-24.8762	-1.92	41.02	0.993	113.91
5 DEC 1990	8230.50	9 4	48.3	17 19	3.0	4.7229	-23.5985	-1.95	41.63	0.993	119.02
10 DEC 1990	8235.50	9 4	20.7	17 22	9.2	4.6566	-22.3117	-1.98	42.22	0.994	124.21
15 DEC 1990	8240.50	9 3	33.4	17 26	39.0	4.5943	-20.8020	-2.01	42.80	0.995	129.50
20 DEC 1990	8245.50	9 2	26.8	17 32	29.0	4.5367	-19.0697	-2.03	43.34	0.996	134.87
25 DEC 1990	8250.50	9 1	1.8	17 39	33.7	4.4844	-17.1326	-2.06	43.84	0.996	140.32
30 DEC 1990	8255.50	8 59	19.7	17 47	45.2	4.4379	-15.0204	-2.08	44.30	0.997	145.84

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1991	8260.50	8 57 22.1	17 58 55.0	4.3978	5.2823	-12.7507	-2.10	44.71	0.998	151.42
9 JAN 1991	8265.50	8 55 10.5	18 6 53.3	4.3644	5.2840	-10.3271	-2.12	45.05	0.999	157.06
14 JAN 1991	8270.50	8 52 47.1	18 17 28.9	4.3382	5.2857	-7.7659	-2.13	45.32	0.999	162.75
19 JAN 1991	8275.50	8 50 14.6	18 28 29.4	4.3196	5.2874	-5.0998	-2.14	45.52	1.000	168.46
24 JAN 1991	8280.50	8 47 35.6	18 39 41.4	4.3088	5.2891	-2.3748	-2.14	45.63	1.000	174.18
29 JAN 1991	8285.50	8 44 53.4	18 50 51.5	4.3059	5.2908	0.3644	-2.14	45.68	1.000	179.24
3 FEB 1991	8290.50	8 42 10.9	19 1 48.2	4.3109	5.2924	3.0960	-2.14	45.61	1.000	-174.23
8 FEB 1991	8295.50	8 39 30.9	19 12 19.7	4.3238	5.2941	5.8028	-2.13	45.47	1.000	-168.53
13 FEB 1991	8300.50	8 36 56.4	19 22 15.7	4.3444	5.2958	8.4511	-2.12	45.26	0.999	-162.85
18 FEB 1991	8305.50	8 34 30.5	19 31 26.8	4.3725	5.2974	10.9995	-2.11	44.97	0.999	-157.21
23 FEB 1991	8310.50	8 32 15.8	19 39 44.4	4.4078	5.2991	13.4070	-2.09	44.61	0.998	-151.62
28 FEB 1991	8315.50	8 30 14.5	19 47 3.1	4.4498	5.3007	15.6513	-2.07	44.19	0.997	-146.11
5 MAR 1991	8320.50	8 28 28.6	19 53 18.5	4.4980	5.3024	17.7322	-2.04	43.71	0.998	-140.67
10 MAR 1991	8325.50	8 26 59.5	19 58 27.4	4.5520	5.3040	19.6425	-2.02	43.19	0.998	-135.30
15 MAR 1991	8330.50	8 25 48.5	20 2 27.9	4.6113	5.3056	21.3618	-1.99	42.84	0.995	-130.03
20 MAR 1991	8335.50	8 24 56.7	20 5 18.3	4.6752	5.3073	22.8690	-1.96	42.06	0.994	-124.84
25 MAR 1991	8340.50	8 24 24.6	20 6 58.1	4.7432	5.3089	24.1550	-1.92	41.45	0.993	-119.75
30 MAR 1991	8345.50	8 24 12.3	20 7 28.6	4.8145	5.3105	25.2315	-1.89	40.84	0.993	-114.75
4 APR 1991	8350.50	8 24 19.8	20 6 50.4	4.8887	5.3121	26.1163	-1.86	40.22	0.992	-109.85
9 APR 1991	8355.50	8 24 46.7	20 5 5.0	4.9652	5.3137	26.8121	-1.82	39.60	0.992	-105.04
14 APR 1991	8360.50	8 25 32.8	20 2 13.4	5.0434	5.3153	27.3105	-1.79	38.99	0.991	-100.32
19 APR 1991	8365.50	8 26 37.4	19 58 16.4	5.1227	5.3169	27.6077	-1.75	38.38	0.991	-95.69
24 APR 1991	8370.50	8 27 59.8	19 53 16.1	5.2026	5.3185	27.7167	-1.72	37.79	0.991	-91.14
29 APR 1991	8375.50	8 29 39.1	19 47 14.3	5.2826	5.3201	27.6821	-1.69	37.22	0.991	-86.68
4 MAY 1991	8380.50	8 31 34.3	19 40 12.4	5.3622	5.3216	27.4608	-1.65	36.67	0.991	-82.30
9 MAY 1991	8385.50	8 33 44.6	19 32 12.1	5.4411	5.3232	27.1134	-1.62	36.14	0.991	-77.98
14 MAY 1991	8390.50	8 36 9.1	19 23 14.1	5.5187	5.3247	26.6138	-1.59	35.63	0.992	-73.74
19 MAY 1991	8395.50	8 38 48.9	19 13 20.0	5.5946	5.3263	25.9668	-1.56	35.14	0.992	-69.56
24 MAY 1991	8400.50	8 41 36.9	19 2 31.7	5.6685	5.3278	25.1945	-1.53	34.69	0.992	-65.44
29 MAY 1991	8405.50	8 44 38.1	18 50 50.6	5.7401	5.3294	24.3163	-1.50	34.25	0.993	-61.38
3 JUN 1991	8410.50	8 47 49.6	18 38 18.6	5.8089	5.3309	23.3463	-1.48	33.85	0.994	-57.37
8 JUN 1991	8415.50	8 51 10.5	18 24 56.8	5.8748	5.3324	22.2742	-1.45	33.47	0.994	-53.41
13 JUN 1991	8420.50	8 54 40.2	18 10 46.1	5.9374	5.3340	21.0961	-1.43	33.11	0.995	-49.49
18 JUN 1991	8425.50	8 58 17.7	17 55 49.0	5.9965	5.3355	19.8242	-1.40	32.79	0.995	-45.61
23 JUN 1991	8430.50	9 2 2.0	17 40 7.1	6.0519	5.3370	18.4817	-1.38	32.49	0.996	-41.77
28 JUN 1991	8435.50	9 5 52.6	17 23 42.6	6.1032	5.3385	17.0813	-1.37	32.22	0.997	-37.96
3 JUL 1991	8440.50	9 9 48.5	17 6 37.4	6.1505	5.3400	15.6241	-1.35	31.97	0.997	-34.18
8 JUL 1991	8445.50	9 13 49.2	16 48 52.9	6.1934	5.3414	14.1018	-1.33	31.75	0.998	-30.41
13 JUL 1991	8450.50	9 17 54.1	16 30 31.2	6.2318	5.3429	12.5124	-1.32	31.55	0.998	-26.67
18 JUL 1991	8455.50	9 22 2.4	16 11 35.3	6.2666	5.3444	10.8752	-1.31	31.38	0.999	-22.94

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1991	8460.50	9 26	13.4	15 52	7.3	6.2948	9.2094	-1.30	31.24	0.999	-19.23
28 JUL 1991	8465.50	9 30	26.5	15 32	10.4	6.3188	7.5199	-1.29	31.12	0.999	-15.53
2 AUG 1991	8470.50	9 34	41.2	16 11	46.9	6.3380	5.8033	-1.28	31.02	1.000	-11.83
7 AUG 1991	8475.50	9 38	57.0	14 50	58.7	6.3523	4.9510	-1.27	30.95	1.000	-8.14
12 AUG 1991	8480.50	9 43	13.2	14 29	49.7	6.3614	2.2692	-1.27	30.91	1.000	-4.47
17 AUG 1991	8485.50	9 47	29.3	14 8	23.1	6.3654	0.4812	-1.27	30.89	1.000	-1.03
22 AUG 1991	8490.50	9 51	44.7	13 46	42.3	6.3642	-1.3000	-1.27	30.89	1.000	3.12
27 AUG 1991	8495.50	9 55	58.8	13 24	51.2	6.3579	-3.0741	-1.27	30.92	1.000	6.80
1 SEP 1991	8500.50	10 0	11.2	13 2	52.5	6.3484	-4.8469	-1.27	30.98	1.000	10.52
6 SEP 1991	8505.50	10 4	21.4	12 40	49.9	6.3299	-6.6224	-1.28	31.06	0.999	14.28
11 SEP 1991	8510.50	10 8	28.7	12 18	48.2	6.3082	-8.3846	-1.28	31.17	0.999	18.06
16 SEP 1991	8515.50	10 12	32.6	11 58	51.4	6.2815	-10.1099	-1.29	31.30	0.999	21.87
21 SEP 1991	8520.50	10 16	32.5	11 35	4.4	6.2499	-11.7911	-1.30	31.46	0.998	25.70
26 SEP 1991	8525.50	10 20	27.7	11 13	31.5	6.2134	-13.4305	-1.32	31.64	0.998	29.58
1 OCT 1991	8530.50	10 24	17.8	10 52	16.6	6.1723	-15.0328	-1.33	31.85	0.997	33.46
6 OCT 1991	8535.50	10 28	2.2	10 31	25.2	6.1268	-16.5930	-1.35	32.09	0.997	37.40
11 OCT 1991	8540.50	10 31	40.2	10 11	2.6	6.0768	-18.0868	-1.36	32.36	0.998	41.38
16 OCT 1991	8545.50	10 35	10.9	9 51	14.5	6.0223	-19.4941	-1.38	32.65	0.998	45.41
21 OCT 1991	8550.50	10 38	33.8	9 32	6.5	5.9641	-20.8118	-1.40	32.97	0.995	49.48
26 OCT 1991	8555.50	10 41	48.2	9 13	43.6	5.9022	-22.0430	-1.42	33.31	0.994	53.60
31 OCT 1991	8560.50	10 44	53.5	8 56	11.3	5.8368	-23.1875	-1.45	33.69	0.994	57.77
5 NOV 1991	8565.50	10 47	48.8	8 39	36.1	5.7683	-24.2289	-1.47	34.09	0.993	62.00
10 NOV 1991	8570.50	10 50	33.2	8 24	4.0	5.6970	-25.1398	-1.50	34.51	0.993	66.30
15 NOV 1991	8575.50	10 53	5.9	8 9	41.7	5.6233	-26.9060	-1.53	34.96	0.992	70.65
20 NOV 1991	8580.50	10 55	26.2	7 56	34.8	5.5475	-28.5278	-1.56	35.44	0.992	75.07
25 NOV 1991	8585.50	10 57	33.4	7 44	28.3	5.4702	-27.0080	-1.59	35.94	0.992	79.56
30 NOV 1991	8590.50	10 59	26.6	7 34	48.6	5.3917	-27.3382	-1.62	36.47	0.992	84.12
5 DEC 1991	8595.50	11 1	4.9	7 25	41.5	5.3125	-27.4941	-1.65	37.01	0.992	88.76
10 DEC 1991	8600.50	11 2	27.7	7 18	32.4	5.2331	-27.4537	-1.68	37.57	0.992	93.48
15 DEC 1991	8605.50	11 3	34.0	7 13	6.3	5.1541	-27.2114	-1.71	38.15	0.992	98.27
20 DEC 1991	8610.50	11 4	23.5	7 9	26.2	5.0761	-26.7743	-1.75	38.73	0.992	103.15
25 DEC 1991	8615.50	11 4	56.7	7 7	34.8	4.9997	-26.1454	-1.78	39.33	0.992	108.10
30 DEC 1991	8620.50	11 5	10.1	7 7	35.1	4.9263	-25.3107	-1.81	39.92	0.993	113.14

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1992	8625.50	11 5 6.4	7 9 28.0	4.8537	5.3895	-24.2521	-1.84	40.51	0.993	118.26	
9 JAN 1992	8630.50	11 4 44.6	7 13 13.4	4.7855	5.3907	-22.9645	-1.87	41.09	0.994	123.47	
14 JAN 1992	8635.50	11 4 4.8	7 18 48.7	4.7213	5.3918	-21.4604	-1.90	41.64	0.995	128.75	
19 JAN 1992	8640.50	11 3 7.6	7 26 8.8	4.6617	5.3930	-19.7615	-1.93	42.18	0.996	134.10	
24 JAN 1992	8645.50	11 1 53.8	7 35 8.4	4.6073	5.3941	-17.8769	-1.95	42.67	0.998	139.52	
29 JAN 1992	8650.50	11 0 24.3	7 45 39.7	4.5587	5.3953	-15.8026	-1.98	43.13	0.997	145.01	
3 FEB 1992	8655.50	10 58 40.3	7 57 33.4	4.5162	5.3964	-13.5463	-2.00	43.54	0.998	150.56	
8 FEB 1992	8660.50	10 56 43.4	8 10 37.5	4.4806	5.3975	-11.1334	-2.01	43.88	0.999	156.15	
13 FEB 1992	8665.50	10 54 35.8	8 24 37.4	4.4520	5.3986	-8.6031	-2.03	44.16	0.999	161.77	
18 FEB 1992	8670.50	10 52 19.7	8 39 18.0	4.4310	5.3997	-5.9938	-2.04	44.37	1.000	167.41	
23 FEB 1992	8675.50	10 49 57.4	8 54 23.9	4.4175	5.4008	-3.3233	-2.04	44.51	1.000	173.02	
28 FEB 1992	8680.50	10 47 31.4	9 9 38.8	4.4118	5.4019	-0.6068	-2.04	44.57	1.000	178.20	
4 MAR 1992	8685.50	10 45 4.2	9 24 46.5	4.4140	5.4029	2.1213	-2.04	44.54	1.000	-175.28	
9 MAR 1992	8690.50	10 42 38.8	9 39 29.9	4.4240	5.4040	4.8176	-2.04	44.44	1.000	-169.74	
14 MAR 1992	8695.50	10 40 17.8	9 53 32.7	4.4417	5.4050	7.4370	-2.03	44.27	0.999	-164.16	
19 MAR 1992	8700.50	10 38 3.6	10 6 41.7	4.4669	5.4061	9.9514	-2.02	44.02	0.999	-158.61	
24 MAR 1992	8705.50	10 35 58.5	10 18 44.4	4.4991	5.4071	12.3540	-2.00	43.70	0.998	-153.10	
29 MAR 1992	8710.50	10 34 4.8	10 29 30.6	4.5381	5.4081	14.6296	-1.98	43.33	0.998	-147.66	
3 APR 1992	8715.50	10 32 23.5	10 38 51.3	4.5835	5.4091	16.7488	-1.96	42.90	0.997	-142.29	
8 APR 1992	8720.50	10 30 56.9	10 46 38.5	4.6347	5.4101	18.6836	-1.93	42.42	0.996	-136.99	
13 APR 1992	8725.50	10 29 46.2	10 52 47.1	4.6912	5.4111	20.4162	-1.91	41.91	0.995	-131.78	
18 APR 1992	8730.50	10 28 51.9	10 57 14.5	4.7524	5.4121	21.9519	-1.88	41.37	0.994	-126.66	
23 APR 1992	8735.50	10 28 14.6	10 59 59.0	4.8178	5.4130	23.3025	-1.85	40.81	0.994	-121.62	
28 APR 1992	8740.50	10 27 54.7	11 1 0.3	4.8868	5.4140	24.4638	-1.82	40.23	0.993	-116.67	
3 MAY 1992	8745.50	10 27 52.3	11 0 18.3	4.9589	5.4149	25.4225	-1.79	39.65	0.992	-111.82	
8 MAY 1992	8750.50	10 28 7.4	10 57 53.6	5.0334	5.4159	26.1717	-1.75	39.08	0.992	-107.05	
13 MAY 1992	8755.50	10 28 39.7	10 53 49.5	5.1098	5.4168	26.7209	-1.72	38.48	0.992	-102.36	
18 MAY 1992	8760.50	10 29 28.5	10 48 8.6	5.1876	5.4177	27.0928	-1.69	37.90	0.991	-97.77	
23 MAY 1992	8765.50	10 30 33.3	10 40 54.7	5.2661	5.4186	27.3020	-1.65	37.34	0.991	-93.25	
28 MAY 1992	8770.50	10 31 53.5	10 32 10.9	5.3451	5.4195	27.3463	-1.62	36.78	0.991	-88.81	
2 JUN 1992	8775.50	10 33 28.4	10 22 0.1	5.4239	5.4204	27.2188	-1.59	36.25	0.991	-84.44	
7 JUN 1992	8780.50	10 35 17.5	10 10 26.3	5.5021	5.4212	26.9246	-1.56	35.73	0.991	-80.14	
12 JUN 1992	8785.50	10 37 19.7	9 57 33.9	5.5793	5.4221	26.4852	-1.53	35.24	0.992	-75.90	
17 JUN 1992	8790.50	10 39 34.2	9 43 27.0	5.6550	5.4229	25.9219	-1.50	34.77	0.992	-71.73	
22 JUN 1992	8795.50	10 42 0.3	9 28 9.9	5.7289	5.4238	25.2420	-1.47	34.32	0.992	-67.61	
27 JUN 1992	8800.50	10 44 37.1	9 11 45.7	5.8006	5.4246	24.4400	-1.44	33.90	0.993	-63.55	
2 JUL 1992	8805.50	10 47 24.1	8 54 17.8	5.8699	5.4254	23.5110	-1.41	33.50	0.993	-59.52	
7 JUL 1992	8810.50	10 50 20.4	8 35 50.8	5.9363	5.4262	22.4684	-1.39	33.12	0.994	-55.54	
12 JUL 1992	8815.50	10 53 25.2	8 16 28.6	5.9996	5.4270	21.3354	-1.37	32.77	0.995	-51.61	
17 JUL 1992	8820.50	10 56 37.7	7 56 15.5	6.0595	5.4278	20.1247	-1.34	32.45	0.995	-47.70	

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1992	8825.50	10 59 57.3	7 35 15.0	7 35 15.0	6.1157	5.4286	18.8364	-1.32	32.15	0.996	-43.83
27 JUL 1992	8830.50	11 3 23.4	7 13 30.0	7 13 30.0	6.1682	5.4293	17.4824	-1.31	31.88	0.996	-39.98
1 AUG 1992	8835.50	11 6 55.5	6 51 4.5	6 51 4.5	6.2165	5.4301	16.0022	-1.29	31.63	0.997	-36.15
6 AUG 1992	8840.50	11 10 32.7	6 28 2.6	6 28 2.6	6.2605	5.4308	14.4759	-1.27	31.41	0.997	-32.34
11 AUG 1992	8845.50	11 14 14.5	6 4 28.1	6 4 28.1	6.3001	5.4315	12.9027	-1.26	31.21	0.998	-28.55
16 AUG 1992	8850.50	11 18 0.3	5 40 25.3	5 40 25.3	6.3350	5.4323	11.2872	-1.25	31.04	0.998	-24.77
21 AUG 1992	8855.50	11 21 49.5	5 15 57.2	5 15 57.2	6.3652	5.4330	9.6252	-1.24	30.89	0.999	-21.00
26 AUG 1992	8860.50	11 25 41.8	4 51 7.0	4 51 7.0	6.3905	5.4337	7.9091	-1.23	30.77	0.999	-17.24
31 AUG 1992	8865.50	11 29 36.5	4 25 59.2	4 25 59.2	6.4109	5.4343	6.1466	-1.22	30.67	1.000	-13.47
5 SEP 1992	8870.50	11 33 33.0	4 0 37.6	4 0 37.6	6.4260	5.4350	4.3616	-1.21	30.60	1.000	-9.72
10 SEP 1992	8875.50	11 37 30.8	3 35 6.7	3 35 6.7	6.4360	5.4357	2.5667	-1.21	30.55	1.000	-5.98
15 SEP 1992	8880.50	11 41 29.3	3 9 30.4	3 9 30.4	6.4408	5.4363	0.7614	-1.21	30.53	1.000	-2.35
20 SEP 1992	8885.50	11 45 28.1	2 43 51.7	2 43 51.7	6.4404	5.4370	-1.0597	-1.21	30.53	1.000	2.00
25 SEP 1992	8890.50	11 49 26.8	2 18 14.8	2 18 14.8	6.4347	5.4376	-2.8996	-1.21	30.58	1.000	5.61
30 SEP 1992	8895.50	11 53 24.8	1 52 44.4	1 52 44.4	6.4237	5.4382	-4.7407	-1.21	30.61	1.000	9.40
5 OCT 1992	8900.50	11 57 21.3	1 27 24.7	1 27 24.7	6.4073	5.4388	-6.5595	-1.22	30.69	1.000	13.23
10 OCT 1992	8905.50	12 1 15.9	1 2 20.7	1 2 20.7	6.3858	5.4394	-8.3498	-1.23	30.79	0.999	17.10
15 OCT 1992	8910.50	12 5 8.0	0 37 35.9	0 37 35.9	6.3591	5.4400	-10.1142	-1.24	30.92	0.999	20.99
20 OCT 1992	8915.50	12 8 57.2	0 13 14.3	0 13 14.3	6.3274	5.4405	-11.8666	-1.25	31.07	0.999	24.91
25 OCT 1992	8920.50	12 12 42.8	0 10 39.1	0 10 39.1	6.2907	5.4411	-13.5710	-1.26	31.26	0.998	28.86
30 OCT 1992	8925.50	12 16 24.1	0 33 59.5	0 33 59.5	6.2491	5.4416	-15.2320	-1.27	31.46	0.998	32.85
4 NOV 1992	8930.50	12 20 0.3	0 56 41.8	0 56 41.8	6.2028	5.4422	-16.8205	-1.29	31.70	0.997	36.88
9 NOV 1992	8935.50	12 23 30.8	-1 18 41.1	-1 18 41.1	6.1520	5.4427	-18.3348	-1.31	31.96	0.996	40.94
14 NOV 1992	8940.50	12 26 55.1	-1 39 53.6	-1 39 53.6	6.0970	5.4432	-19.7778	-1.33	32.25	0.996	45.04
19 NOV 1992	8945.50	12 30 12.3	-2 0 14.3	-2 0 14.3	6.0379	5.4437	-21.1486	-1.35	32.56	0.995	49.19
24 NOV 1992	8950.50	12 33 21.8	-2 19 37.8	-2 19 37.8	5.9749	5.4442	-22.4300	-1.37	32.91	0.995	53.39
29 NOV 1992	8955.50	12 36 22.5	-2 37 59.1	-2 37 59.1	5.9084	5.4447	-23.5948	-1.39	33.28	0.994	57.64
4 DEC 1992	8960.50	12 39 13.7	-2 55 12.6	-2 55 12.6	5.8388	5.4451	-24.6304	-1.42	33.67	0.994	61.94
9 DEC 1992	8965.50	12 41 54.6	-3 11 13.9	-3 11 13.9	5.7663	5.4458	-25.5384	-1.45	34.10	0.993	66.29
14 DEC 1992	8970.50	12 44 24.4	-3 25 58.8	-3 25 58.8	5.6914	5.4460	-26.3208	-1.47	34.55	0.993	70.70
19 DEC 1992	8975.50	12 46 42.3	-3 39 21.9	-3 39 21.9	5.6144	5.4465	-26.9686	-1.50	35.02	0.992	75.18
24 DEC 1992	8980.50	12 48 47.4	-3 51 18.4	-3 51 18.4	5.5358	5.4469	-27.4572	-1.53	35.52	0.992	79.71
29 DEC 1992	8985.50	12 50 38.6	-4 1 43.1	-4 1 43.1	5.4560	5.4473	-27.7647	-1.56	36.04	0.992	84.31

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1993	8990.50	12 52	15.3	-4-10-31.9	5.3756	5.4477	-27.8870	-1.60	38.58	0.992	88.98
8 JAN 1993	8995.50	12 53	36.8	-4-17-41.7	5.2951	5.4481	-27.8301	-1.63	37.13	0.992	93.72
13 JAN 1993	9000.50	12 54	42.4	-4-23-9.0	5.2150	5.4484	-27.5947	-1.68	37.70	0.992	98.52
18 JAN 1993	9005.50	12 55	31.4	-4-28-50.6	5.1369	5.4488	-27.1647	-1.70	38.28	0.992	103.40
23 JAN 1993	9010.50	12 56	3.3	-4-28-43.9	5.0584	5.4491	-26.5192	-1.73	38.87	0.993	108.35
28 JAN 1993	9015.50	12 56	17.6	-4-28-47.0	4.9830	5.4495	-26.5611	-1.76	39.46	0.993	113.38
2 FEB 1993	9020.50	12 56	14.2	-4-27-0.3	4.9104	5.4498	-24.5694	-1.79	40.04	0.994	118.48
7 FEB 1993	9025.50	12 55	53.3	-4-23-25.3	4.8413	5.4501	-23.2899	-1.82	40.61	0.994	123.66
12 FEB 1993	9030.50	12 55	14.9	-4-18-3.8	4.7761	5.4504	-21.8151	-1.85	41.17	0.995	128.89
17 FEB 1993	9035.50	12 54	19.5	-4-10-59.1	4.7155	5.4507	-20.1343	-1.88	41.70	0.996	134.19
22 FEB 1993	9040.50	12 53	7.8	-4-2-16.1	4.6600	5.4510	-18.2481	-1.91	42.19	0.997	139.56
27 FEB 1993	9045.50	12 51	40.8	-3-52-2.0	4.6103	5.4512	-16.1749	-1.93	42.65	0.997	144.99
4 MAR 1993	9050.50	12 49	60.0	-3-40-26.8	4.5667	5.4515	-13.9460	-1.95	43.05	0.998	150.46
9 MAR 1993	9055.50	12 48	7.0	-3-27-41.3	4.5298	5.4517	-11.5916	-1.97	43.40	0.999	155.97
14 MAR 1993	9060.50	12 46	3.6	-3-13-57.2	4.4999	5.4519	-9.1222	-1.98	43.69	0.999	161.50
19 MAR 1993	9065.50	12 43	51.8	-2-59-28.1	4.4773	5.4522	-6.5481	-1.99	43.91	1.000	167.05
24 MAR 1993	9070.50	12 41	34.0	-2-44-28.4	4.4622	5.4524	-3.8995	-2.00	44.08	1.000	172.57
29 MAR 1993	9075.50	12 39	12.6	-2-29-16.0	4.4548	5.4526	-1.2179	-2.00	44.14	1.000	177.69
3 APR 1993	9080.50	12 36	50.3	-2-14-4.8	4.4551	5.4527	1.4522	-2.00	44.13	1.000	-175.78
8 APR 1993	9085.50	12 34	29.5	-1-59-13.3	4.4631	5.4529	4.0616	-2.00	44.05	1.000	-170.40
13 APR 1993	9090.50	12 32	12.7	-1-44-56.1	4.4786	5.4531	6.6605	-1.99	43.90	0.999	-164.93
18 APR 1993	9095.50	12 30	1.9	-1-31-27.0	4.5015	5.4532	9.1682	-1.98	43.68	0.999	-159.47
23 APR 1993	9100.50	12 27	59.6	-1-19-0.2	4.5315	5.4533	11.5689	-1.97	43.39	0.998	-154.05
28 APR 1993	9105.50	12 26	7.7	-1-7-48.7	4.5682	5.4535	13.8279	-1.95	43.04	0.998	-148.69
3 MAY 1993	9110.50	12 24	28.0	0-58-2.5	4.6112	5.4536	15.9204	-1.93	42.64	0.997	-143.39
8 MAY 1993	9115.50	12 23	1.7	0-49-49.4	4.6600	5.4537	17.8444	-1.90	42.19	0.996	-138.17
13 MAY 1993	9120.50	12 21	50.0	0-43-15.5	4.7141	5.4538	19.6049	-1.88	41.71	0.995	-133.03
18 MAY 1993	9125.50	12 20	53.6	0-38-25.4	4.7730	5.4538	21.1897	-1.85	41.19	0.995	-127.96
23 MAY 1993	9130.50	12 20	13.3	0-35-22.9	4.8363	5.4539	22.5794	-1.82	40.65	0.994	-122.98
28 MAY 1993	9135.50	12 19	49.6	0-34-10.1	4.9033	5.4539	23.7623	-1.79	40.10	0.993	-118.08
2 JUN 1993	9140.50	12 19	42.4	0-34-48.4	4.9733	5.4540	24.7431	-1.76	39.53	0.993	-113.27
7 JUN 1993	9145.50	12 19	51.8	0-37-10.5	5.0460	5.4540	25.5413	-1.73	38.96	0.992	-108.53
12 JUN 1993	9150.50	12 20	17.5	0-41-19.7	5.1207	5.4540	26.1676	-1.70	38.40	0.992	-103.88
17 JUN 1993	9155.50	12 20	59.1	0-47-11.7	5.1969	5.4540	26.6157	-1.67	37.83	0.991	-99.30
22 JUN 1993	9160.50	12 21	56.3	0-54-44.0	5.2742	5.4540	26.8774	-1.64	37.28	0.991	-94.80
27 JUN 1993	9165.50	12 23	8.7	-1-3-52.0	5.3520	5.4540	26.9568	-1.60	36.74	0.991	-90.37
2 JUL 1993	9170.50	12 24	35.6	-1-14-31.3	5.4298	5.4539	26.8744	-1.57	36.21	0.991	-86.00
7 JUL 1993	9175.50	12 26	16.2	-1-28-36.5	5.5071	5.4539	26.6509	-1.54	35.70	0.991	-81.70
12 JUL 1993	9180.50	12 28	9.9	-1-40-2.7	5.5835	5.4538	26.2914	-1.51	35.21	0.992	-77.48
17 JUL 1993	9185.50	12 30	16.2	-1-54-46.0	5.6588	5.4538	25.7895	-1.48	34.75	0.992	-73.27

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1993	9190.50	12 32	34.4	-2-10-41.4	5.7324	5.4537	25.1413	-1.45	34.30	0.992	-69.13
27 JUL 1993	9195.50	12 35	3.8	-2-27-43.5	5.8039	5.4536	24.3606	-1.43	33.88	0.993	-65.04
1 AUG 1993	9200.50	12 37	43.6	-2-45-47.1	5.8729	5.4535	23.4708	-1.40	33.48	0.993	-60.99
6 AUG 1993	9205.50	12 40	33.1	-3-4-46.6	5.9393	5.4533	22.4842	-1.38	33.10	0.994	-56.98
11 AUG 1993	9210.50	12 43	31.7	-3-24-37.6	6.0027	5.4532	21.3996	-1.36	32.75	0.994	-53.00
16 AUG 1993	9215.50	12 46	39.0	-3-45-15.9	6.0628	5.4531	20.2093	-1.33	32.43	0.995	-49.05
21 AUG 1993	9220.50	12 49	54.1	-4-8-38.5	6.1193	5.4529	18.9146	-1.31	32.13	0.996	-45.13
26 AUG 1993	9225.50	12 53	16.6	-4-28-34.4	6.1720	5.4527	17.5361	-1.29	31.86	0.996	-41.23
31 AUG 1993	9230.50	12 58	45.7	-4-51-4.5	6.2205	5.4526	16.0931	-1.28	31.61	0.997	-37.35
5 SEP 1993	9235.50	13 0	20.9	-5-14-2.0	6.2649	5.4524	14.5894	-1.26	31.38	0.997	-33.48
10 SEP 1993	9240.50	13 4	1.6	-5-37-23.3	6.3047	5.4522	13.0205	-1.25	31.19	0.998	-29.62
15 SEP 1993	9245.50	13 7	47.4	-6-1-4.2	6.3400	5.4520	11.3797	-1.24	31.01	0.998	-25.78
20 SEP 1993	9250.50	13 11	37.7	-6-24-59.7	6.3704	5.4517	9.6766	-1.23	30.86	0.999	-21.93
25 SEP 1993	9255.50	13 15	31.9	-6-49-5.7	6.3958	5.4515	7.9356	-1.22	30.74	0.999	-18.09
30 SEP 1993	9260.50	13 19	29.4	-7-13-17.0	6.4162	5.4512	6.1685	-1.21	30.64	0.999	-14.26
5 OCT 1993	9265.50	13 23	29.6	-7-37-30.0	6.4314	5.4510	4.3742	-1.21	30.57	1.000	-10.43
10 OCT 1993	9270.50	13 27	32.2	-8-1-41.3	6.4414	5.4507	2.5477	-1.20	30.52	1.000	-6.61
15 OCT 1993	9275.50	13 31	36.5	-8-25-46.4	6.4461	5.4504	0.6874	-1.20	30.50	1.000	-2.86
20 OCT 1993	9280.50	13 35	42.1	-8-49-41.2	6.4454	5.4501	-1.1875	-1.20	30.50	1.000	1.62
25 OCT 1993	9285.50	13 39	48.2	-9-13-21.4	6.4393	5.4498	-3.0539	-1.20	30.53	1.000	5.22
30 OCT 1993	9290.50	13 43	54.2	-9-36-42.6	6.4278	5.4495	-4.9066	-1.21	30.59	1.000	9.08
4 NOV 1993	9295.50	13 47	59.6	-9-59-41.8	6.4109	5.4492	-6.7485	-1.21	30.67	1.000	12.99
9 NOV 1993	9300.50	13 52	3.8	-10-22-15.5	6.3888	5.4488	-8.5828	-1.22	30.78	0.999	16.92
14 NOV 1993	9305.50	13 56	6.2	-10-44-19.6	6.3614	5.4484	-10.4021	-1.23	30.91	0.999	20.89
19 NOV 1993	9310.50	14 0	6.0	-11-5-50.4	6.3288	5.4481	-12.1802	-1.24	31.07	0.999	24.88
24 NOV 1993	9315.50	14 4	2.5	-11-26-43.6	6.2911	5.4477	-13.8993	-1.26	31.25	0.998	28.90
29 NOV 1993	9320.50	14 7	55.0	-11-46-58.2	6.2485	5.4473	-15.5592	-1.27	31.47	0.998	32.95
4 DEC 1993	9325.50	14 11	42.8	-12-6-25.3	6.2013	5.4469	-17.1625	-1.29	31.71	0.997	37.03
9 DEC 1993	9330.50	14 15	25.1	-12-25-7.4	6.1495	5.4465	-18.7079	-1.31	31.97	0.996	41.14
14 DEC 1993	9335.50	14 19	1.2	-12-42-59.3	6.0933	5.4461	-20.1773	-1.33	32.27	0.996	45.30
19 DEC 1993	9340.50	14 22	30.0	-12-59-57.5	6.0330	5.4456	-21.5440	-1.35	32.59	0.995	49.49
24 DEC 1993	9345.50	14 25	50.7	-13-15-58.5	5.9690	5.4452	-22.7975	-1.37	32.94	0.995	53.73
29 DEC 1993	9350.50	14 29	2.5	-13-31-0.3	5.9015	5.4447	-23.9408	-1.40	33.32	0.994	58.00

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	14 32	4.5	-13-45 -0.2	5.8308	5.4442	-24.9755	-1.42	33.72	0.994	62.32
8 JAN 1994	9360.50	14 34	55.8	-13-57-55.3	5.7574	5.4437	-25.8921	-1.45	34.15	0.993	66.69
13 JAN 1994	9365.50	14 37	35.5	-14 -9-43.1	5.6814	5.4432	-26.8680	-1.48	34.61	0.993	71.11
18 JAN 1994	9370.50	14 40	2.3	-14-20-20.5	5.6035	5.4427	-27.2765	-1.51	35.09	0.992	75.59
23 JAN 1994	9375.50	14 42	15.6	-14-29-45.5	5.5241	5.4422	-27.7213	-1.54	35.59	0.992	80.11
28 JAN 1994	9380.50	14 44	14.5	-14-37-58.7	5.4436	5.4417	-28.0062	-1.57	36.12	0.992	84.70
2 FEB 1994	9385.50	14 45	58.0	-14-44-51.9	5.3625	5.4411	-28.1302	-1.60	36.67	0.992	89.34
7 FEB 1994	9390.50	14 47	25.4	-14-50-29.4	5.2813	5.4406	-28.0761	-1.64	37.23	0.992	94.04
12 FEB 1994	9395.50	14 48	35.9	-14-54-47.2	5.2005	5.4400	-27.8218	-1.67	37.81	0.992	98.81
17 FEB 1994	9400.50	14 49	28.6	-14-57-43.8	5.1208	5.4394	-27.3591	-1.71	38.40	0.992	103.65
22 FEB 1994	9405.50	14 50	3.3	-14-59-19.2	5.0427	5.4388	-26.6955	-1.74	38.99	0.993	108.54
27 FEB 1994	9410.50	14 50	19.6	-14-59-33.1	4.9668	5.4382	-25.8422	-1.77	39.59	0.993	113.51
4 MAR 1994	9415.50	14 50	17.3	-14-58-25.4	4.8938	5.4376	-24.7963	-1.80	40.18	0.994	118.54
9 MAR 1994	9420.50	14 49	56.3	-14-55-58.7	4.8238	5.4370	-23.5421	-1.84	40.76	0.994	123.63
14 MAR 1994	9425.50	14 49	16.7	-14-52 -7.8	4.7579	5.4364	-22.0745	-1.87	41.32	0.995	128.79
19 MAR 1994	9430.50	14 48	19.2	-14-47 -1.5	4.6965	5.4357	-20.4053	-1.89	41.86	0.996	134.02
24 MAR 1994	9435.50	14 47	4.6	-14-40-41.8	4.6402	5.4351	-18.5585	-1.92	42.37	0.996	139.30
29 MAR 1994	9440.50	14 45	34.1	-14-33-13.2	4.5894	5.4344	-16.5554	-1.95	42.84	0.997	144.63
3 APR 1994	9445.50	14 43	48.9	-14-24-41.1	4.5447	5.4337	-14.3982	-1.97	43.26	0.998	150.01
8 APR 1994	9450.50	14 41	50.7	-14-15-12.0	4.5064	5.4330	-12.0901	-1.99	43.63	0.999	155.42
13 APR 1994	9455.50	14 39	41.4	-14 -4-54.1	4.4750	5.4323	-9.6547	-2.00	43.94	0.999	160.87
18 APR 1994	9460.50	14 37	23.3	-13-53-57.6	4.4508	5.4316	-7.1278	-2.01	44.18	1.000	166.33
23 APR 1994	9465.50	14 34	58.8	-13-42-33.6	4.4339	5.4309	-4.5496	-2.02	44.34	1.000	171.78
28 APR 1994	9470.50	14 32	30.5	-13-30-53.1	4.4245	5.4301	-1.9463	-2.03	44.44	1.000	177.05
3 MAY 1994	9475.50	14 30	0.8	-13-19 -8.4	4.4227	5.4294	0.6728	-2.03	44.46	1.000	178.79
8 MAY 1994	9480.50	14 27	32.3	-13 -7-31.1	4.4284	5.4286	3.2852	-2.03	44.40	1.000	171.52
13 MAY 1994	9485.50	14 25	7.6	-12-56-14.5	4.4416	5.4279	5.8517	-2.02	44.27	1.000	166.12
18 MAY 1994	9490.50	14 22	49.3	-12-45-31.7	4.4621	5.4271	8.3333	-2.01	44.06	0.999	160.72
23 MAY 1994	9495.50	14 20	39.5	-12-35-34.0	4.4898	5.4263	10.6991	-2.00	43.79	0.998	155.37
28 MAY 1994	9500.50	14 18	40.4	-12-26-31.8	4.5238	5.4255	12.9408	-1.98	43.46	0.998	150.07
2 JUN 1994	9505.50	14 16	53.4	-12-18-33.9	4.5642	5.4247	15.0562	-1.96	43.08	0.997	144.83
7 JUN 1994	9510.50	14 15	20.2	-12-11-48.3	4.6106	5.4238	17.0249	-1.94	42.64	0.996	139.85
12 JUN 1994	9515.50	14 14	2.0	-12 -6-22.6	4.6624	5.4230	18.8201	-1.92	42.17	0.996	134.54
17 JUN 1994	9520.50	14 12	60.0	-12 -2-21.9	4.7191	5.4222	20.4238	-1.89	41.66	0.995	129.50
22 JUN 1994	9525.50	14 12	14.7	-11-59-49.8	4.7802	5.4213	21.8348	-1.86	41.13	0.994	124.54
27 JUN 1994	9530.50	14 11	46.4	-11-58-47.4	4.8450	5.4204	23.0673	-1.83	40.58	0.993	119.68
2 JUL 1994	9535.50	14 11	35.4	-11-59-15.6	4.9132	5.4196	24.1267	-1.80	40.02	0.993	114.86
7 JUL 1994	9540.50	14 11	41.8	-12 -1-14.5	4.9842	5.4187	25.0016	-1.77	39.45	0.992	110.13
12 JUL 1994	9545.50	14 12	5.5	-12 -4-43.2	5.0574	5.4178	25.6808	-1.74	38.88	0.992	105.47
17 JUL 1994	9550.50	14 12	46.2	-12 -9-39.2	5.1323	5.4169	26.1665	-1.71	38.31	0.991	100.88

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1994	9555.50	14 13 43.6	-12-15-59.2	5.2084	5.4159	26.4770	-1.68	37.75	0.991	-96.37
27 JUL 1994	9560.50	14 14 57.1	-12-23-38.9	5.2851	5.4150	26.6314	-1.65	37.20	0.991	-91.92
1 AUG 1994	9565.50	14 16 26.0	-12-32-34.2	5.3620	5.4141	26.6327	-1.62	36.67	0.991	-87.53
6 AUG 1994	9570.50	14 18 10.1	-12-42-41.4	5.4388	5.4131	26.4724	-1.59	36.15	0.991	-83.20
11 AUG 1994	9575.50	14 20 8.6	-12-53-55.5	5.5148	5.4122	26.1474	-1.58	35.65	0.991	-78.92
16 AUG 1994	9580.50	14 22 20.9	-13 -6-11.4	5.5898	5.4112	25.6718	-1.53	35.18	0.992	-74.70
21 AUG 1994	9585.50	14 24 46.3	-13-19-23.7	5.6629	5.4102	25.0685	-1.50	34.72	0.992	-70.52
26 AUG 1994	9590.50	14 27 24.0	-13-33-28.5	5.7343	5.4092	24.3495	-1.47	34.29	0.993	-66.38
31 AUG 1994	9595.50	14 30 13.5	-13-48-15.2	5.8034	5.4082	23.5124	-1.45	33.88	0.993	-62.28
5 SEP 1994	9600.50	14 33 14.2	-14 -3-45.0	5.8700	5.4072	22.5494	-1.42	33.50	0.994	-58.22
10 SEP 1994	9605.50	14 36 25.3	-14-19-50.4	5.9335	5.4062	21.4637	-1.40	33.14	0.994	-54.18
15 SEP 1994	9610.50	14 39 46.3	-14-36-28.2	5.9938	5.4051	20.2768	-1.38	32.80	0.995	-50.17
20 SEP 1994	9615.50	14 43 16.4	-14-53-26.8	6.0506	5.4041	19.0075	-1.36	32.50	0.995	-46.19
25 SEP 1994	9620.50	14 46 54.9	-15-10-47.2	6.1035	5.4030	17.6592	-1.34	32.21	0.996	-42.22
30 SEP 1994	9625.50	14 50 41.4	-15-28-23.4	6.1525	5.4020	16.2267	-1.32	31.96	0.997	-38.28
5 OCT 1994	9630.50	14 54 35.2	-15-46-10.5	6.1972	5.4009	14.7048	-1.31	31.73	0.997	-34.34
10 OCT 1994	9635.50	14 58 35.7	-16 -4 -3.9	6.2373	5.3998	13.1048	-1.29	31.52	0.998	-30.42
15 OCT 1994	9640.50	15 2 42.3	-16-21-59.1	6.2728	5.3987	11.4514	-1.28	31.34	0.998	-26.50
20 OCT 1994	9645.50	15 6 54.1	-16-39-51.1	6.3034	5.3976	9.7559	-1.27	31.19	0.999	-22.59
25 OCT 1994	9650.50	15 11 10.8	-16-57-36.5	6.3291	5.3965	8.0166	-1.28	31.07	0.999	-18.69
30 OCT 1994	9655.50	15 15 31.8	-17-15-11.8	6.3497	5.3954	6.2287	-1.26	30.96	0.999	-14.78
4 NOV 1994	9660.50	15 19 56.3	-17-32-32.8	6.3650	5.3943	4.3923	-1.25	30.89	1.000	-10.87
9 NOV 1994	9665.50	15 24 23.9	-17-49-36.2	6.3750	5.3931	2.5280	-1.25	30.84	1.000	-6.97
14 NOV 1994	9670.50	15 28 53.6	-18 -6-18.2	6.3796	5.3920	0.6586	-1.25	30.82	1.000	-3.11
19 NOV 1994	9675.50	15 33 24.9	-18-22-35.5	6.3788	5.3908	-1.2120	-1.25	30.82	1.000	1.21
24 NOV 1994	9680.50	15 37 57.1	-18-38-25.9	6.3726	5.3896	-3.0869	-1.25	30.85	1.000	4.93
29 NOV 1994	9685.50	15 42 29.7	-18-53-46.7	6.3610	5.3884	-4.9680	-1.26	30.91	1.000	8.85
4 DEC 1994	9690.50	15 47 1.8	-19 -8-36.2	6.3439	5.3873	-6.8482	-1.26	30.99	1.000	12.81
9 DEC 1994	9695.50	15 51 32.7	-19-22-49.4	6.3215	5.3861	-8.6992	-1.27	31.10	0.999	16.79
14 DEC 1994	9700.50	15 56 1.6	-19-36-26.7	6.2937	5.3849	-10.5051	-1.28	31.24	0.999	20.79
19 DEC 1994	9705.50	16 0 27.6	-19-49-26.0	6.2608	5.3836	-12.2673	-1.29	31.40	0.999	24.81
24 DEC 1994	9710.50	16 4 50.2	-20 -1-46.1	6.2229	5.3824	-13.9884	-1.31	31.60	0.998	28.85
29 DEC 1994	9715.50	16 9 8.5	-20-13-25.6	6.1801	5.3812	-15.6662	-1.32	31.81	0.998	32.91

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1995	9720.50	16 13	21.6	-20-24-23.9	6.1325	5.3799	-17.2825	-1.34	32.08	0.997	37.01
8 JAN 1995	9725.50	16 17	28.5	-20-34-40.0	6.0804	5.3787	-18.8112	-1.36	32.34	0.996	41.12
13 JAN 1995	9730.50	16 21	28.3	-20-44-13.3	6.0239	5.3774	-20.2442	-1.38	32.64	0.996	46.27
18 JAN 1995	9735.50	16 25	20.3	-20-53-4.6	5.9635	5.3761	-21.5859	-1.40	32.97	0.995	49.44
23 JAN 1995	9740.50	16 29	3.4	-21-1-13.5	5.8994	5.3749	-22.8374	-1.42	33.33	0.995	53.65
28 JAN 1995	9745.50	16 32	36.9	-21-8-40.6	5.8317	5.3736	-23.9894	-1.45	33.71	0.994	57.90
2 FEB 1995	9750.50	16 35	59.6	-21-15-26.7	5.7609	5.3723	-25.0176	-1.48	34.13	0.993	62.18
7 FEB 1995	9755.50	16 39	10.4	-21-21-31.8	5.6874	5.3710	-25.9027	-1.51	34.57	0.993	66.50
12 FEB 1995	9760.50	16 42	8.5	-21-26-57.4	5.6115	5.3696	-26.8446	-1.53	35.04	0.992	70.87
17 FEB 1995	9765.50	16 44	52.9	-21-31-44.8	5.5336	5.3683	-27.2492	-1.57	35.53	0.992	75.28
22 FEB 1995	9770.50	16 47	22.8	-21-35-54.8	5.4542	5.3670	-27.7145	-1.60	36.05	0.992	79.73
27 FEB 1995	9775.50	16 49	37.1	-21-39-28.9	5.3737	5.3656	-28.0231	-1.63	36.59	0.991	84.24
4 MAR 1995	9780.50	16 51	34.8	-21-42-27.9	5.2926	5.3643	-28.1523	-1.66	37.15	0.991	88.80
9 MAR 1995	9785.50	16 53	15.1	-21-44-53.0	5.2113	5.3629	-28.0937	-1.70	37.73	0.991	93.42
14 MAR 1995	9790.50	16 54	37.4	-21-46-45.7	5.1305	5.3616	-27.8643	-1.73	38.32	0.991	98.09
19 MAR 1995	9795.50	16 55	40.8	-21-48-6.9	5.0506	5.3602	-27.4419	-1.77	38.93	0.992	102.82
24 MAR 1995	9800.50	16 56	25.0	-21-48-57.4	4.9722	5.3588	-26.8498	-1.80	39.54	0.992	107.61
29 MAR 1995	9805.50	16 56	49.4	-21-49-18.2	4.8957	5.3574	-26.0589	-1.84	40.16	0.993	112.47
3 APR 1995	9810.50	16 56	53.5	-21-49-9.2	4.8219	5.3560	-25.0589	-1.87	40.78	0.993	117.39
8 APR 1995	9815.50	16 56	37.5	-21-48-31.3	4.7512	5.3546	-23.8586	-1.90	41.38	0.994	122.38
13 APR 1995	9820.50	16 56	1.7	-21-47-25.2	4.6842	5.3532	-22.4695	-1.93	41.97	0.994	127.43
18 APR 1995	9825.50	16 55	6.4	-21-45-50.7	4.6216	5.3518	-20.9101	-1.96	42.54	0.995	132.54
23 APR 1995	9830.50	16 53	52.4	-21-43-48.6	4.5637	5.3503	-19.1729	-1.99	43.08	0.996	137.70
28 APR 1995	9835.50	16 52	20.5	-21-41-18.9	4.5110	5.3489	-17.2526	-2.02	43.59	0.997	142.93
3 MAY 1995	9840.50	16 50	32.2	-21-38-22.2	4.4642	5.3475	-15.1641	-2.04	44.04	0.998	148.21
8 MAY 1995	9845.50	16 48	29.1	-21-35-0.2	4.4236	5.3460	-12.9354	-2.06	44.45	0.998	153.53
13 MAY 1995	9850.50	16 46	13.3	-21-31-14.5	4.3896	5.3445	-10.6989	-2.08	44.79	0.999	158.89
18 MAY 1995	9855.50	16 43	47.1	-21-27-7.4	4.3624	5.3431	-8.1744	-2.09	45.07	0.999	164.28
23 MAY 1995	9860.50	16 41	12.8	-21-22-41.9	4.3424	5.3416	-5.6866	-2.10	45.28	1.000	169.68
28 MAY 1995	9865.50	16 38	33.0	-21-18-1.4	4.3298	5.3401	-3.0954	-2.11	45.41	1.000	175.07
2 JUN 1995	9870.50	16 35	50.6	-21-13-10.9	4.3246	5.3386	-0.4988	-2.11	45.46	1.000	-179.01
7 JUN 1995	9875.50	16 33	8.5	-21-9-16.0	4.3269	5.3371	2.0828	-2.11	45.44	1.000	-173.95
12 JUN 1995	9880.50	16 30	29.6	-21-3-22.2	4.3366	5.3356	4.6155	-2.11	45.34	1.000	-168.57
17 JUN 1995	9885.50	16 27	56.5	-20-58-36.2	4.3535	5.3341	7.0860	-2.10	45.16	0.999	-163.21
22 JUN 1995	9890.50	16 25	31.6	-20-54-3.7	4.3774	5.3326	9.4862	-2.09	44.92	0.999	-157.87
27 JUN 1995	9895.50	16 23	17.3	-20-49-51.2	4.4082	5.3311	11.7880	-2.07	44.60	0.998	-152.58
2 JUL 1995	9900.50	16 21	15.9	-20-46-5.4	4.4454	5.3295	13.9570	-2.06	44.23	0.997	-147.33
7 JUL 1995	9905.50	16 19	29.2	-20-42-51.8	4.4886	5.3280	16.9676	-2.04	43.80	0.997	-142.15
12 JUL 1995	9910.50	16 17	58.6	-20-40-15.3	4.5374	5.3264	17.8102	-2.01	43.33	0.996	-137.03
17 JUL 1995	9915.50	16 16	45.3	-20-38-19.9	4.5913	5.3249	19.4922	-1.99	42.82	0.995	-131.97

GEOCENTRIC EPHEMERIS FOR JUPITER

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	16 15	50.1	-20-37 -8.2	4.6499	5.3233	21.0120	-1.96	42.28	0.994	-126.99
27 JUL 1995	9925.50	16 15	13.7	-20-36-43.3	4.7125	5.3217	22.3509	-1.93	41.72	0.993	-122.07
1 AUG 1995	9930.50	16 14	58.5	-20-37 -6.5	4.7788	5.3202	23.4934	-1.90	41.14	0.993	-117.23
6 AUG 1995	9935.50	16 14	58.8	-20-38-17.9	4.8480	5.3185	24.4372	-1.87	40.58	0.992	-112.45
11 AUG 1995	9940.50	16 15	20.5	-20-40-17.3	4.9197	5.3170	25.1969	-1.84	39.96	0.992	-107.75
16 AUG 1995	9945.50	16 16	1.1	-20-43 -2.6	4.9934	5.3154	25.7889	-1.81	39.38	0.991	-103.12
21 AUG 1995	9950.50	16 17	0.4	-20-46-32.0	5.0685	5.3138	26.2127	-1.78	38.79	0.991	-98.55
26 AUG 1995	9955.50	16 18	18.0	-20-50-43.3	5.1446	5.3122	26.4574	-1.75	38.22	0.991	-94.04
31 AUG 1995	9960.50	16 19	53.4	-20-55-33.2	5.2211	5.3105	26.5198	-1.72	37.68	0.991	-89.59
5 SEP 1995	9965.50	16 21	46.0	-21 0-58.2	5.2976	5.3090	26.4132	-1.68	37.11	0.991	-85.19
10 SEP 1995	9970.50	16 23	54.9	-21 0-54.0	5.3735	5.3074	26.1600	-1.65	36.59	0.991	-80.85
15 SEP 1995	9975.50	16 26	19.4	-21-13-16.2	5.4485	5.3057	25.7713	-1.62	36.09	0.991	-76.56
20 SEP 1995	9980.50	16 28	58.9	-21-20 -1.0	5.5222	5.3041	25.2435	-1.60	35.60	0.992	-72.32
25 SEP 1995	9985.50	16 31	52.6	-21-27 -3.9	5.5942	5.3024	24.5690	-1.57	35.15	0.992	-68.11
30 SEP 1995	9990.50	16 34	59.9	-21-34-20.4	5.6640	5.3008	23.7526	-1.54	34.71	0.993	-63.94
5 OCT 1995	9995.50	16 38	19.8	-21-41-46.0	5.7313	5.2991	22.8161	-1.52	34.31	0.993	-59.80
10 OCT 1995	10000.50	16 41	51.4	-21-49-15.9	5.7957	5.2975	21.7783	-1.49	33.92	0.994	-55.70
15 OCT 1995	10005.50	16 45	34.1	-21-56-45.9	5.8570	5.2958	20.8421	-1.47	33.57	0.995	-51.63
20 OCT 1995	10010.50	16 49	27.2	-22 -4-12.1	5.9148	5.2942	19.4020	-1.45	33.24	0.995	-47.57
25 OCT 1995	10015.50	16 53	29.8	-22-11-30.2	5.9689	5.2925	18.0542	-1.43	32.94	0.996	-43.54
30 OCT 1995	10020.50	16 57	41.3	-22-18-36.6	6.0190	5.2908	16.6118	-1.41	32.67	0.996	-39.53
4 NOV 1995	10025.50	17 2	0.8	-22-25-27.5	6.0648	5.2891	15.0996	-1.40	32.42	0.997	-35.53
9 NOV 1995	10030.50	17 6	27.4	-22-31-59.1	6.1061	5.2874	13.5285	-1.38	32.20	0.998	-31.55
14 NOV 1995	10035.50	17 11	0.5	-22-38 -8.9	6.1429	5.2857	11.8965	-1.37	32.01	0.998	-27.58
19 NOV 1995	10040.50	17 15	39.3	-22-43-53.8	6.1748	5.2840	10.1989	-1.36	31.84	0.999	-23.62
24 NOV 1995	10045.50	17 20	23.3	-22-49-11.1	6.2017	5.2823	8.4377	-1.35	31.70	0.999	-19.66
29 NOV 1995	10050.50	17 25	11.4	-22-53-58.9	6.2235	5.2806	6.8347	-1.35	31.59	0.999	-15.71
4 DEC 1995	10055.50	17 30	2.9	-22-58-14.8	6.2400	5.2789	4.8119	-1.34	31.51	1.000	-11.76
9 DEC 1995	10060.50	17 34	57.0	-23 -1-57.4	6.2512	5.2772	2.9726	-1.34	31.45	1.000	-7.82
14 DEC 1995	10065.50	17 39	53.1	-23 -5 -5.7	6.2571	5.2755	1.1132	-1.34	31.42	1.000	-3.88
19 DEC 1995	10070.50	17 44	50.3	-23 -7-38.5	6.2576	5.2737	-0.7680	-1.34	31.42	1.000	0.27
24 DEC 1995	10075.50	17 49	48.1	-23 -9-35.5	6.2527	5.2720	-2.6609	-1.34	31.45	1.000	4.04
29 DEC 1995	10080.50	17 54	45.3	-23-10-56.5	6.2423	5.2703	-4.5390	-1.34	31.50	1.000	7.99

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1986	6435.50	16 16	4.6	-19-27-21.6	10.7200	9.9726	-18.1130	1.47	15.46	0.999	38.79
10 JAN 1986	6440.50	16 18	9.4	-19-32-10.6	10.6851	9.9733	-19.8718	1.45	15.54	0.999	43.38
15 JAN 1986	6445.50	16 20	8.5	-19-36-37.0	10.6054	9.9740	-21.5013	1.44	15.63	0.999	48.00
20 JAN 1986	6450.50	16 22	1.4	-19-40-39.6	10.5411	9.9748	-22.9838	1.43	15.72	0.998	52.84
25 JAN 1986	6455.50	16 23	47.5	-19-44-18.7	10.4728	9.9755	-24.3194	1.41	15.82	0.998	57.30
30 JAN 1986	6460.50	16 25	26.3	-19-47-34.1	10.4008	9.9762	-25.5100	1.40	15.93	0.998	61.99
4 FEB 1986	6465.50	16 26	57.2	-19-50-25.2	10.3258	9.9769	-26.5479	1.38	16.05	0.998	66.70
9 FEB 1986	6470.50	16 28	19.8	-19-52-52.4	10.2476	9.9776	-27.4108	1.37	16.17	0.998	71.44
14 FEB 1986	6475.50	16 29	33.3	-19-54-55.4	10.1675	9.9783	-28.0759	1.35	16.30	0.998	76.20
19 FEB 1986	6480.50	16 30	37.6	-19-56-34.2	10.0857	9.9789	-28.5389	1.33	16.43	0.998	81.00
24 FEB 1986	6485.50	16 31	32.1	-19-57-49.6	10.0028	9.9796	-28.8083	1.32	16.57	0.998	85.82
1 MAR 1986	6490.50	16 32	16.7	-19-58-41.4	9.9195	9.9803	-28.8882	1.30	16.71	0.998	90.68
6 MAR 1986	6495.50	16 32	51.0	-19-59-10.2	9.8362	9.9810	-28.7674	1.28	16.85	0.998	96.54
11 MAR 1986	6500.50	16 33	14.7	-19-59-16.4	9.7535	9.9817	-28.4273	1.26	16.99	0.998	100.45
16 MAR 1986	6505.50	16 33	27.7	-19-59-0.1	9.6722	9.9823	-27.8617	1.24	17.13	0.998	105.38
21 MAR 1986	6510.50	16 33	30.1	-19-58-22.2	9.5928	9.9830	-27.0814	1.23	17.28	0.998	110.34
26 MAR 1986	6515.50	16 33	21.9	-19-57-23.7	9.5160	9.9837	-26.1040	1.21	17.42	0.998	115.33
31 MAR 1986	6520.50	16 33	3.4	-19-56-4.7	9.4422	9.9843	-24.9358	1.19	17.55	0.998	120.35
5 APR 1986	6525.50	16 32	34.6	-19-54-26.7	9.3722	9.9850	-23.6867	1.18	17.68	0.998	125.39
10 APR 1986	6530.50	16 31	56.0	-19-52-30.0	9.3063	9.9857	-21.9943	1.16	17.81	0.999	130.46
15 APR 1986	6535.50	16 31	8.1	-19-50-15.8	9.2453	9.9863	-20.2331	1.15	17.93	0.999	135.55
20 APR 1986	6540.50	16 30	11.4	-19-47-46.1	9.1896	9.9870	-18.3092	1.13	18.03	0.999	140.65
25 APR 1986	6545.50	16 29	6.8	-19-45-1.8	9.1397	9.9876	-16.2482	1.12	18.13	0.999	145.78
30 APR 1986	6550.50	16 27	55.1	-19-42-4.7	9.0959	9.9882	-14.0574	1.11	18.22	0.999	150.91
5 MAY 1986	6555.50	16 26	37.0	-19-38-56.6	9.0586	9.9889	-11.7368	1.10	18.30	1.000	156.06
10 MAY 1986	6560.50	16 25	13.6	-19-35-39.2	9.0282	9.9895	-9.3051	1.10	18.36	1.000	161.21
15 MAY 1986	6565.50	16 23	46.0	-19-32-15.3	8.9050	9.9901	-6.7942	1.09	18.40	1.000	166.34
20 MAY 1986	6570.50	16 22	15.2	-19-28-47.2	8.8900	9.9908	-4.2388	1.09	18.44	1.000	171.42
25 MAY 1986	6575.50	16 20	42.7	-19-25-17.4	8.9805	9.9914	-1.6643	1.08	18.45	1.000	176.25
30 MAY 1986	6580.50	16 19	9.3	-19-21-48.8	8.9794	9.9920	0.9242	1.08	18.46	1.000	-177.14
4 JUN 1986	6585.50	16 17	36.4	-19-18-23.8	8.9859	9.9926	3.5149	1.09	18.44	1.000	-172.55
9 JUN 1986	6590.50	16 16	5.0	-19-15-5.5	8.9997	9.9932	6.0763	1.09	18.42	1.000	-167.51
14 JUN 1986	6595.50	16 14	36.4	-19-11-57.1	9.0209	9.9938	8.5736	1.09	18.37	1.000	-162.43
19 JUN 1986	6600.50	16 13	11.8	-19-9-1.1	9.0491	9.9944	10.9781	1.10	18.31	1.000	-157.36
24 JUN 1986	6605.50	16 11	52.1	-19-6-20.6	9.0842	9.9950	13.2785	1.11	18.24	0.999	-152.28
29 JUN 1986	6610.50	16 10	38.1	-19-3-57.7	9.1257	9.9956	15.4755	1.12	18.16	0.999	-147.23
4 JUL 1986	6615.50	16 9	30.8	-19-1-54.6	9.1735	9.9962	17.5528	1.13	18.07	0.999	-142.21
9 JUL 1986	6620.50	16 8	31.0	-19-0-14.0	9.2270	9.9968	19.4814	1.14	17.96	0.999	-137.21
14 JUL 1986	6625.50	16 7	39.4	-18-58-57.7	9.2858	9.9974	21.2382	1.16	17.85	0.999	-132.24
19 JUL 1986	6630.50	16 6	56.5	-18-58-6.8	9.3495	9.9980	22.8134	1.17	17.73	0.998	-127.31

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6635.50	16 6	22.8	-18-57-43.0	9.4174	9.9986	24.2141	1.19	17.60	0.998	-122.41
29 JUL 1986	6640.50	16 5	58.6	-18-57-46.4	9.4891	9.9991	25.4448	1.21	17.47	0.998	-117.54
3 AUG 1986	6645.50	16 5	44.2	-18-58-17.8	9.5642	9.9997	26.4909	1.22	17.33	0.998	-112.71
8 AUG 1986	6650.50	16 5	39.8	-18-59-17.8	9.6419	10.0003	27.3339	1.24	17.19	0.998	-107.91
13 AUG 1986	6655.50	16 5	45.5	-19 0-45.8	9.7218	10.0009	27.9871	1.26	17.05	0.998	-103.14
18 AUG 1986	6660.50	16 6	1.3	-19 2-41.5	9.8033	10.0014	28.4003	1.28	16.91	0.997	-98.41
23 AUG 1986	6665.50	16 6	27.1	-19 5-4.1	9.8857	10.0020	28.8502	1.30	16.76	0.997	-93.71
28 AUG 1986	6670.50	16 7	2.8	-19 7-52.0	9.9686	10.0025	28.7193	1.31	16.63	0.997	-89.03
2 SEP 1986	6675.50	16 7	48.2	-19-11-4.8	10.0514	10.0031	28.5969	1.33	16.49	0.997	-84.38
7 SEP 1986	6680.50	16 8	43.2	-19-14-40.8	10.1335	10.0036	28.2745	1.35	16.35	0.998	-79.76
12 SEP 1986	6685.50	16 9	47.4	-19-18-38.0	10.2145	10.0042	27.7606	1.37	16.23	0.998	-75.17
17 SEP 1986	6690.50	16 11	0.4	-19-22-55.2	10.2937	10.0047	27.0772	1.38	16.10	0.998	-70.59
22 SEP 1986	6695.50	16 12	21.9	-19-27-29.6	10.3707	10.0052	26.2368	1.40	15.98	0.998	-66.04
27 SEP 1986	6700.50	16 13	51.6	-19-32-19.7	10.4451	10.0058	25.2449	1.42	15.87	0.998	-61.51
2 OCT 1986	6705.50	16 15	28.9	-19-37-23.7	10.5164	10.0063	24.0888	1.43	15.76	0.998	-56.99
7 OCT 1986	6710.50	16 17	13.5	-19-42-38.9	10.5841	10.0068	22.7716	1.44	15.66	0.998	-52.49
12 OCT 1986	6715.50	16 19	5.0	-19-48-3.6	10.6477	10.0073	21.3146	1.46	15.56	0.999	-48.00
17 OCT 1986	6720.50	16 21	2.7	-19-53-35.3	10.7071	10.0079	19.7422	1.47	15.48	0.999	-43.52
22 OCT 1986	6725.50	16 23	6.2	-19-59-11.7	10.7617	10.0084	18.0824	1.48	15.40	0.999	-39.05
27 OCT 1986	6730.50	16 25	14.9	-20 4-51.2	10.8113	10.0089	16.2737	1.49	15.33	0.999	-34.58
1 NOV 1986	6735.50	16 27	28.4	-20-10-31.5	10.8555	10.0094	14.3746	1.50	15.27	0.999	-30.12
6 NOV 1986	6740.50	16 29	46.2	-20-16-10.8	10.8942	10.0099	12.3772	1.51	15.21	1.000	-25.67
11 NOV 1986	6745.50	16 32	7.5	-20-21-46.8	10.9270	10.0104	10.3112	1.51	15.17	1.000	-21.22
16 NOV 1986	6750.50	16 34	31.8	-20-27-17.7	10.9537	10.0109	8.1959	1.52	15.13	1.000	-16.77
21 NOV 1986	6755.50	16 36	58.6	-20-32-42.0	10.9743	10.0114	6.0340	1.52	15.10	1.000	-12.33
26 NOV 1986	6760.50	16 39	27.3	-20-37-58.5	10.9885	10.0119	3.8261	1.53	15.08	1.000	-7.92
1 DEC 1986	6765.50	16 41	57.3	-20-43-5.0	10.9963	10.0123	1.5773	1.53	15.07	1.000	-3.63
6 DEC 1986	6770.50	16 44	28.1	-20-48-0.8	10.9976	10.0128	-0.6890	1.53	15.07	1.000	1.90
11 DEC 1986	6775.50	16 46	58.7	-20-52-44.3	10.9923	10.0133	-2.9421	1.53	15.08	1.000	5.86
16 DEC 1986	6780.50	16 49	28.8	-20-57-14.4	10.9806	10.0138	-6.1712	1.53	15.09	1.000	10.27
21 DEC 1986	6785.50	16 51	57.8	-21 1-30.7	10.9625	10.0142	-7.3759	1.52	15.12	1.000	14.74
26 DEC 1986	6790.50	16 54	24.8	-21 6-32.1	10.9381	10.0147	-9.5525	1.52	15.15	1.000	19.23
31 DEC 1986	6795.50	16 56	49.6	-21 9-18.0	10.9074	10.0152	-11.6876	1.51	15.19	1.000	23.75

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	16 59	11.1	-21-12-48.4	10.8708	10.0158	-13.7508	1.50	15.25	0.999	28.29
10 JAN 1987	6805.50	17 1	28.9	-21-16 -2.1	10.8281	10.0161	-15.7189	1.50	15.31	0.999	32.84
15 JAN 1987	6810.50	17 3	42.4	-21-18-59.7	10.7799	10.0165	-17.6894	1.49	15.37	0.999	37.41
20 JAN 1987	6815.50	17 5	50.8	-21-21-41.3	10.7268	10.0170	-19.3628	1.48	15.45	0.999	42.00
25 JAN 1987	6820.50	17 7	53.8	-21-24 -6.3	10.6682	10.0174	-21.0318	1.48	15.54	0.999	46.80
30 JAN 1987	6825.50	17 9	50.6	-21-26-15.6	10.6052	10.0179	-22.6749	1.45	15.63	0.999	51.23
4 FEB 1987	6830.50	17 11	40.5	-21-28 -9.1	10.5380	10.0183	-23.9648	1.44	15.73	0.998	55.87
9 FEB 1987	6835.50	17 13	23.0	-21-29-47.1	10.4670	10.0187	-25.1898	1.42	15.83	0.998	60.54
14 FEB 1987	6840.50	17 14	57.7	-21-31-10.6	10.3926	10.0192	-26.2553	1.41	15.95	0.998	65.23
19 FEB 1987	6845.50	17 16	24.0	-21-32-19.8	10.3155	10.0196	-27.1620	1.39	16.07	0.998	69.94
24 FEB 1987	6850.50	17 17	41.5	-21-33-15.3	10.2359	10.0200	-27.8987	1.37	16.19	0.998	74.67
1 MAR 1987	6855.50	17 18	49.7	-21-33-58.1	10.1545	10.0204	-28.4422	1.36	16.32	0.998	79.44
6 MAR 1987	6860.50	17 19	48.0	-21-34-28.1	10.0719	10.0208	-28.7762	1.34	16.45	0.998	84.22
11 MAR 1987	6865.50	17 20	36.3	-21-34-46.5	9.9885	10.0212	-28.9042	1.32	16.59	0.998	89.04
16 MAR 1987	6870.50	17 21	14.3	-21-34-54.0	9.9051	10.0216	-28.8371	1.30	16.73	0.998	93.87
21 MAR 1987	6875.50	17 21	41.8	-21-34-50.7	9.8222	10.0220	-28.5768	1.29	16.87	0.998	98.74
26 MAR 1987	6880.50	17 21	58.7	-21-34-37.7	9.7474	10.0224	-28.1098	1.27	17.02	0.998	103.63
31 MAR 1987	6885.50	17 22	4.6	-21-34-15.3	9.6800	10.0228	-27.4213	1.25	17.16	0.998	108.56
5 APR 1987	6890.50	17 21	59.9	-21-33-43.6	9.5821	10.0232	-26.5142	1.23	17.30	0.998	113.51
10 APR 1987	6895.50	17 21	44.6	-21-33 -3.9	9.5071	10.0236	-25.4052	1.22	17.43	0.998	118.48
15 APR 1987	6900.50	17 21	18.9	-21-32-16.0	9.4358	10.0240	-24.1121	1.20	17.56	0.998	123.48
20 APR 1987	6905.50	17 20	43.3	-21-31-20.4	9.3680	10.0244	-22.6383	1.18	17.69	0.998	128.50
25 APR 1987	6910.50	17 19	58.1	-21-30-17.9	9.3050	10.0248	-20.9749	1.17	17.81	0.999	133.55
30 APR 1987	6915.50	17 19	3.7	-21-29 -8.2	9.2471	10.0251	-19.1269	1.16	17.92	0.999	138.63
5 MAY 1987	6920.50	17 18	1.0	-21-27-52.4	9.1947	10.0255	-17.1172	1.14	18.02	0.999	143.72
10 MAY 1987	6925.50	17 16	50.7	-21-26-31.0	9.1483	10.0259	-14.9742	1.13	18.12	0.999	148.83
15 MAY 1987	6930.50	17 15	33.7	-21-25 -4.2	9.1083	10.0262	-12.7209	1.12	18.20	1.000	153.94
20 MAY 1987	6935.50	17 14	11.0	-21-23-33.2	9.0750	10.0266	-10.3822	1.11	18.26	1.000	159.07
25 MAY 1987	6940.50	17 12	43.4	-21-21-58.5	9.0486	10.0269	-7.9019	1.11	18.32	1.000	164.20
30 MAY 1987	6945.50	17 11	12.2	-21-20-20.9	9.0294	10.0273	-5.3668	1.10	18.35	1.000	169.31
4 JUN 1987	6950.50	17 9	38.6	-21-18-42.3	9.0176	10.0276	-2.7915	1.10	18.38	1.000	174.36
9 JUN 1987	6955.50	17 8	3.7	-21-17 -3.3	9.0133	10.0280	-0.2086	1.10	18.39	1.000	178.36
14 JUN 1987	6960.50	17 6	28.8	-21-15-25.6	9.0164	10.0283	2.3626	1.10	18.38	1.000	-174.85
19 JUN 1987	6965.50	17 4	55.0	-21-13-50.7	9.0269	10.0286	4.9187	1.10	18.36	1.000	-169.84
24 JUN 1987	6970.50	17 3	23.4	-21-12-19.6	9.0448	10.0290	7.4435	1.11	18.32	1.000	-164.76
29 JUN 1987	6975.50	17 1	55.3	-21-10-54.8	9.0698	10.0293	9.9018	1.11	18.27	1.000	-159.67
4 JUL 1987	6980.50	17 0	31.8	-21 -9-37.7	9.1019	10.0296	12.2618	1.12	18.21	1.000	-154.59
9 JUL 1987	6985.50	16 59	13.8	-21 -8-29.7	9.1405	10.0300	14.5022	1.13	18.13	0.999	-149.53
14 JUL 1987	6990.50	16 58	2.4	-21 -7-32.7	9.1855	10.0303	16.6182	1.14	18.04	0.999	-144.49
19 JUL 1987	6995.50	16 56	58.1	-21 -6-47.7	9.2364	10.0306	18.6100	1.15	17.94	0.999	-139.48

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1987	7000.50	16 58	1.9	-21 -6-16.1	9.2928	10.0309	20.4581	1.17	17.83	0.999	-134.49
29 JUL 1987	7005.50	16 55	14.3	-21 -5-59.5	9.3544	10.0312	22.1344	1.18	17.72	0.998	-129.53
3 AUG 1987	7010.50	16 54	36.0	-21 -5-58.3	9.4205	10.0315	23.6221	1.20	17.59	0.998	-124.60
8 AUG 1987	7015.50	16 54	7.5	-21 -6-13.4	9.4908	10.0318	24.9198	1.21	17.46	0.998	-119.71
13 AUG 1987	7020.50	16 53	48.7	-21 -6-45.3	9.5642	10.0321	26.0376	1.23	17.33	0.998	-114.85
18 AUG 1987	7025.50	16 53	40.2	-21 -7-33.7	9.6408	10.0324	26.9765	1.25	17.19	0.998	-110.01
23 AUG 1987	7030.50	16 53	41.9	-21 -8-39.1	9.7199	10.0327	27.7202	1.27	17.05	0.998	-105.21
28 AUG 1987	7035.50	16 53	54.1	-21 -10 -1.2	9.8007	10.0330	28.2536	1.28	16.91	0.998	-100.44
2 SEP 1987	7040.50	16 54	16.6	-21 -11-39.0	9.8828	10.0332	28.5772	1.30	16.77	0.997	-95.69
7 SEP 1987	7045.50	16 54	49.4	-21 -13-32.5	9.9658	10.0335	28.7063	1.32	16.63	0.997	-90.98
12 SEP 1987	7050.50	16 55	32.2	-21 -15-39.9	10.0485	10.0338	28.8557	1.34	16.49	0.997	-86.30
17 SEP 1987	7055.50	16 56	24.9	-21 -18 -0.4	10.1309	10.0340	28.4238	1.36	16.36	0.998	-81.64
22 SEP 1987	7060.50	16 57	27.1	-21 -20-33.2	10.2124	10.0343	27.9999	1.37	16.23	0.998	-77.00
27 SEP 1987	7065.50	16 58	38.7	-21 -23-16.3	10.2924	10.0346	27.3808	1.39	16.10	0.998	-72.38
2 OCT 1987	7070.50	16 59	59.1	-21 -26 -8.6	10.3704	10.0348	26.5815	1.41	15.98	0.998	-67.79
7 OCT 1987	7075.50	17 1	28.0	-21 -29 -8.4	10.4458	10.0351	25.8253	1.42	15.87	0.998	-63.22
12 OCT 1987	7080.50	17 3	4.9	-21 -32-13.7	10.5183	10.0353	24.5226	1.44	15.76	0.998	-58.66
17 OCT 1987	7085.50	17 4	49.5	-21 -35-23.4	10.5873	10.0356	23.2698	1.45	15.65	0.998	-54.12
22 OCT 1987	7090.50	17 6	41.1	-21 -38-35.7	10.6525	10.0358	21.8630	1.47	15.56	0.999	-49.59
27 OCT 1987	7095.50	17 8	39.4	-21 -41-48.7	10.7134	10.0361	20.3099	1.48	15.47	0.999	-45.07
1 NOV 1987	7100.50	17 10	43.7	-21 -45 -1.2	10.7697	10.0363	18.6362	1.49	15.39	0.999	-40.58
6 NOV 1987	7105.50	17 12	53.5	-21 -48-11.0	10.8210	10.0365	16.8643	1.50	15.32	0.999	-36.06
11 NOV 1987	7110.50	17 15	8.3	-21 -51-17.1	10.8670	10.0368	14.9975	1.51	15.25	0.999	-31.57
16 NOV 1987	7115.50	17 17	27.4	-21 -54-18.1	10.9075	10.0370	13.0344	1.52	15.18	0.999	-27.08
21 NOV 1987	7120.50	17 19	50.4	-21 -57-12.3	10.9422	10.0372	10.9783	1.52	15.15	1.000	-22.60
26 NOV 1987	7125.50	17 22	16.7	-21 -59-59.0	10.9708	10.0374	8.8477	1.53	15.11	1.000	-18.11
1 DEC 1987	7130.50	17 24	45.5	-22 -2-36.9	10.9932	10.0376	6.8733	1.53	15.08	1.000	-13.64
6 DEC 1987	7135.50	17 27	16.2	-22 -5 -4.6	11.0093	10.0378	4.4703	1.54	15.05	1.000	-9.18
11 DEC 1987	7140.50	17 29	48.3	-22 -7-22.2	11.0190	10.0380	2.2378	1.54	15.04	1.000	-4.76
16 DEC 1987	7145.50	17 32	21.2	-22 -9-28.4	11.0222	10.0382	-0.0210	1.54	15.04	1.000	-1.14
21 DEC 1987	7150.50	17 34	54.3	-22 -11-22.8	11.0189	10.0384	-2.2952	1.54	15.04	1.000	4.52
26 DEC 1987	7155.50	17 37	26.9	-22 -13 -5.5	11.0090	10.0386	-4.5575	1.54	15.05	1.000	8.95
31 DEC 1987	7160.50	17 39	58.2	-22 -14-35.7	10.9926	10.0388	-6.7800	1.53	15.08	1.000	13.44

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	7165.50	17 42	27.7	-22-15-53.7	10.9699	10.0390	-8.9574	1.53	15.11	1.000	17.94
10 JAN 1988	7170.50	17 44	54.8	-22-16-59.9	10.9409	10.0392	-11.0908	1.52	15.15	1.000	22.48
15 JAN 1988	7175.50	17 47	18.9	-22-17-54.0	10.9059	10.0394	-13.1722	1.52	15.20	1.000	27.00
20 JAN 1988	7180.50	17 49	39.3	-22-18-37.0	10.8649	10.0395	-15.1837	1.51	15.25	0.999	31.54
25 JAN 1988	7185.50	17 51	55.4	-22-19-9.3	10.8183	10.0397	-17.0962	1.50	15.32	0.999	36.10
30 JAN 1988	7190.50	17 54	6.5	-22-19-31.1	10.7683	10.0399	-18.8893	1.49	15.39	0.999	40.88
4 FEB 1988	7195.50	17 56	12.1	-22-19-44.1	10.7093	10.0400	-20.5687	1.48	15.48	0.999	45.27
9 FEB 1988	7200.50	17 58	11.5	-22-19-48.6	10.6476	10.0402	-22.1332	1.46	15.57	0.999	49.87
14 FEB 1988	7205.50	18 0	4.3	-22-19-45.5	10.5816	10.0404	-23.5712	1.45	15.68	0.998	54.49
19 FEB 1988	7210.50	18 1	49.9	-22-19-36.5	10.5116	10.0405	-24.8595	1.44	15.77	0.998	59.14
24 FEB 1988	7215.50	18 3	27.5	-22-19-21.9	10.4382	10.0407	-25.9747	1.42	15.88	0.998	63.80
29 FEB 1988	7220.50	18 4	56.9	-22-19-3.4	10.3618	10.0408	-26.9134	1.41	15.99	0.998	68.48
5 MAR 1988	7225.50	18 6	17.5	-22-18-42.0	10.2829	10.0410	-27.6833	1.39	16.12	0.998	73.18
10 MAR 1988	7230.50	18 7	28.9	-22-18-18.5	10.2020	10.0411	-28.2834	1.37	16.24	0.998	77.90
15 MAR 1988	7235.50	18 8	30.8	-22-17-54.3	10.1197	10.0412	-28.6987	1.35	16.38	0.998	82.65
20 MAR 1988	7240.50	18 9	22.8	-22-17-30.4	10.0365	10.0414	-28.9078	1.34	16.51	0.998	87.43
25 MAR 1988	7245.50	18 10	4.2	-22-17-7.3	9.9530	10.0415	-28.9028	1.32	16.65	0.998	92.23
30 MAR 1988	7250.50	18 10	35.2	-22-16-46.5	9.8698	10.0416	-28.6929	1.30	16.79	0.998	97.06
4 APR 1988	7255.50	18 10	55.7	-22-16-28.1	9.7874	10.0417	-28.2900	1.28	16.93	0.998	101.91
9 APR 1988	7260.50	18 11	5.5	-22-16-12.6	9.7066	10.0418	-27.6929	1.26	17.07	0.998	106.79
14 APR 1988	7265.50	18 11	4.6	-22-16-1.1	9.6277	10.0420	-26.8871	1.25	17.21	0.998	111.69
19 APR 1988	7270.50	18 10	53.0	-22-15-52.9	9.5515	10.0421	-25.8642	1.23	17.35	0.998	116.63
24 APR 1988	7275.50	18 10	31.0	-22-15-48.9	9.4785	10.0422	-24.8356	1.21	17.48	0.998	121.59
29 APR 1988	7280.50	18 9	58.8	-22-15-48.8	9.4094	10.0423	-23.2219	1.20	17.61	0.998	126.58
4 MAY 1988	7285.50	18 9	16.9	-22-15-51.9	9.3446	10.0424	-21.6393	1.18	17.74	0.999	131.59
9 MAY 1988	7290.50	18 8	25.7	-22-15-58.7	9.2846	10.0425	-19.8888	1.17	17.85	0.999	136.62
14 MAY 1988	7295.50	18 7	25.9	-22-16-8.3	9.2299	10.0425	-17.9644	1.16	17.96	0.999	141.68
19 MAY 1988	7300.50	18 6	18.1	-22-16-20.2	9.1810	10.0426	-15.8797	1.14	18.05	0.999	146.76
24 MAY 1988	7305.50	18 5	3.1	-22-16-34.3	9.1383	10.0427	-13.6642	1.13	18.14	0.999	151.85
29 MAY 1988	7310.50	18 3	42.0	-22-16-49.6	9.1022	10.0428	-11.3462	1.12	18.21	1.000	156.96
3 JUN 1988	7315.50	18 2	15.8	-22-17-5.7	9.0728	10.0429	-8.9450	1.12	18.27	1.000	162.08
8 JUN 1988	7320.50	18 0	45.4	-22-17-22.5	9.0506	10.0429	-6.4643	1.11	18.31	1.000	167.19
13 JUN 1988	7325.50	17 59	11.9	-22-17-39.0	9.0356	10.0430	-3.9134	1.11	18.34	1.000	172.30
18 JUN 1988	7330.50	17 57	36.7	-22-17-55.7	9.0280	10.0431	-1.3257	1.11	18.36	1.000	177.28
23 JUN 1988	7335.50	17 56	0.8	-22-18-12.2	9.0279	10.0431	1.2627	1.11	18.36	1.000	-177.10
28 JUN 1988	7340.50	17 54	25.8	-22-18-28.2	9.0353	10.0432	3.8249	1.11	18.34	1.000	-172.11
3 JUL 1988	7345.50	17 52	52.3	-22-18-44.5	9.0500	10.0432	6.3467	1.11	18.31	1.000	-167.02
8 JUL 1988	7350.50	17 51	21.8	-22-19-0.8	9.0719	10.0433	8.8246	1.12	18.27	1.000	-161.92
13 JUL 1988	7355.50	17 49	55.4	-22-19-17.7	9.1009	10.0433	11.2375	1.12	18.21	1.000	-156.83
18 JUL 1988	7360.50	17 48	34.2	-22-19-36.1	9.1367	10.0434	13.5488	1.13	18.14	0.999	-151.75

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	17 47	19.2	-22-19-56.0	9.1790	10.0434	15.7315	1.14	18.06	0.999	-146.69
28 JUL 1988	7370.50	17 46	11.3	-22-20-18.2	9.2274	10.0434	17.7726	1.15	17.96	0.999	-141.65
2 AUG 1988	7375.50	17 45	11.2	-22-20-43.6	9.2815	10.0435	19.6717	1.17	17.86	0.999	-138.65
7 AUG 1988	7380.50	17 44	19.6	-22-21-11.9	9.3409	10.0435	21.4269	1.18	17.74	0.999	-131.66
12 AUG 1988	7385.50	17 43	37.0	-22-21-44.4	9.4051	10.0435	23.0158	1.20	17.62	0.998	-126.70
17 AUG 1988	7390.50	17 43	4.2	-22-22-21.1	9.4736	10.0435	24.4134	1.21	17.49	0.998	-121.77
22 AUG 1988	7395.50	17 42	41.4	-22-23-2.1	9.5459	10.0436	25.6104	1.23	17.36	0.998	-116.87
27 AUG 1988	7400.50	17 42	28.9	-22-23-48.0	9.6213	10.0436	26.6125	1.25	17.23	0.998	-112.01
1 SEP 1988	7405.50	17 42	26.8	-22-24-38.3	9.6994	10.0436	27.4303	1.26	17.09	0.998	-107.17
6 SEP 1988	7410.50	17 42	35.3	-22-25-32.8	9.7796	10.0436	28.0609	1.28	16.95	0.998	-102.36
11 SEP 1988	7415.50	17 42	54.3	-22-26-31.7	9.8613	10.0436	28.4875	1.30	16.81	0.998	-97.58
16 SEP 1988	7420.50	17 43	23.9	-22-27-33.9	9.9439	10.0436	28.7003	1.32	16.67	0.998	-92.82
21 SEP 1988	7425.50	17 44	3.9	-22-28-39.1	10.0268	10.0436	28.7071	1.34	16.53	0.998	-88.09
26 SEP 1988	7430.50	17 44	53.9	-22-29-46.7	10.1095	10.0436	28.5268	1.35	16.39	0.998	-83.39
1 OCT 1988	7435.50	17 45	53.8	-22-30-55.1	10.1914	10.0435	28.1703	1.37	16.26	0.998	-78.71
6 OCT 1988	7440.50	17 47	3.2	-22-32-4.4	10.2721	10.0435	27.6331	1.39	16.13	0.998	-74.06
11 OCT 1988	7445.50	17 48	21.8	-22-33-12.9	10.3508	10.0435	26.9065	1.40	16.01	0.998	-69.42
16 OCT 1988	7450.50	17 49	49.2	-22-34-19.5	10.4273	10.0435	26.9938	1.42	15.89	0.998	-64.81
21 OCT 1988	7455.50	17 51	25.0	-22-35-23.7	10.5008	10.0435	24.9153	1.44	15.78	0.998	-60.21
26 OCT 1988	7460.50	17 53	8.5	-22-36-23.8	10.5710	10.0434	23.6942	1.45	15.68	0.998	-55.63
31 OCT 1988	7465.50	17 54	59.4	-22-37-18.9	10.6375	10.0434	22.3357	1.46	15.58	0.999	-51.06
5 NOV 1988	7470.50	17 56	57.1	-22-38-8.2	10.6999	10.0433	20.8354	1.48	15.49	0.999	-46.51
10 NOV 1988	7475.50	17 59	1.0	-22-38-50.2	10.7577	10.0433	19.1943	1.49	15.41	0.999	-41.97
15 NOV 1988	7480.50	18 1	10.8	-22-39-24.4	10.8106	10.0432	17.4262	1.50	15.33	0.999	-37.43
20 NOV 1988	7485.50	18 3	25.6	-22-39-49.9	10.8583	10.0432	15.5597	1.51	15.26	0.999	-32.91
25 NOV 1988	7490.50	18 5	44.9	-22-40-5.5	10.9004	10.0431	13.6137	1.52	15.20	0.999	-28.40
30 NOV 1988	7495.50	18 8	8.1	-22-40-11.3	10.9368	10.0431	11.5876	1.52	15.15	1.000	-23.89
5 DEC 1988	7500.50	18 10	34.6	-22-40-6.2	10.9673	10.0430	9.4816	1.53	15.11	1.000	-19.38
10 DEC 1988	7505.50	18 13	3.9	-22-39-49.9	10.9915	10.0429	7.3052	1.53	15.08	1.000	-14.88
15 DEC 1988	7510.50	18 15	35.3	-22-39-22.7	11.0094	10.0429	5.0817	1.54	15.05	1.000	-10.39
20 DEC 1988	7515.50	18 18	8.0	-22-38-43.8	11.0209	10.0428	2.8408	1.54	15.04	1.000	-5.90
25 DEC 1988	7520.50	18 20	41.5	-22-37-53.6	11.0258	10.0427	0.5923	1.54	15.03	1.000	-1.54
30 DEC 1988	7525.50	18 23	15.2	-22-36-52.7	11.0243	10.0426	-1.6664	1.54	15.03	1.000	3.23

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1989	7530.50	18 25	48.5	-22-35-40.8	11.0162	10.0426	-3.9287	1.54	15.04	1.000	7.68
9 JAN 1989	7535.50	18 28	20.7	-22-34-18.9	11.0016	10.0426	-6.1781	1.54	15.06	1.000	12.18
14 JAN 1989	7540.50	18 30	51.1	-22-32-47.8	10.9805	10.0424	-8.3857	1.53	15.09	1.000	16.69
19 JAN 1989	7545.50	18 33	19.1	-22-31-7.9	10.9532	10.0423	-10.5285	1.53	15.13	1.000	21.21
24 JAN 1989	7550.50	18 35	44.1	-22-29-20.8	10.9198	10.0422	-12.6066	1.52	15.18	1.000	25.74
29 JAN 1989	7555.50	18 38	5.5	-22-27-27.2	10.8805	10.0421	-14.6208	1.51	15.23	0.999	30.27
3 FEB 1989	7560.50	18 40	22.8	-22-25-28.3	10.8354	10.0420	-16.5592	1.50	15.30	0.999	34.82
8 FEB 1989	7565.50	18 42	35.2	-22-23-26.0	10.7849	10.0419	-18.3998	1.49	15.37	0.999	39.37
13 FEB 1989	7570.50	18 44	42.2	-22-21-21.2	10.7293	10.0417	-20.1158	1.48	15.45	0.999	43.94
18 FEB 1989	7575.50	18 46	43.2	-22-19-15.8	10.6689	10.0416	-21.6968	1.47	15.53	0.999	48.52
23 FEB 1989	7580.50	18 48	37.5	-22-17-11.4	10.6041	10.0415	-23.1490	1.46	15.63	0.998	53.12
28 FEB 1989	7585.50	18 50	24.9	-22-15-9.2	10.5353	10.0414	-24.4704	1.44	15.73	0.998	57.73
5 MAR 1989	7590.50	18 52	4.7	-22-13-11.2	10.4629	10.0412	-25.6454	1.43	15.84	0.998	62.35
10 MAR 1989	7595.50	18 53	36.3	-22-11-19.2	10.3874	10.0411	-26.6505	1.41	15.96	0.998	67.00
15 MAR 1989	7600.50	18 54	59.4	-22-9-34.3	10.3092	10.0410	-27.4691	1.39	16.08	0.998	71.67
20 MAR 1989	7605.50	18 56	13.5	-22-7-58.7	10.2289	10.0408	-28.1043	1.38	16.20	0.998	76.36
25 MAR 1989	7610.50	18 57	18.1	-22-6-33.4	10.1470	10.0407	-28.5850	1.36	16.33	0.998	81.07
30 MAR 1989	7615.50	18 58	13.1	-22-5-19.5	10.0641	10.0405	-28.8470	1.34	16.47	0.998	85.80
4 APR 1989	7620.50	18 58	58.1	-22-4-18.8	9.9806	10.0404	-28.9328	1.32	16.61	0.998	90.56
9 APR 1989	7625.50	18 59	32.8	-22-3-31.9	9.8972	10.0402	-28.8053	1.31	16.75	0.998	95.34
14 APR 1989	7630.50	18 59	57.0	-22-2-59.9	9.8144	10.0401	-28.4645	1.29	16.89	0.998	100.15
19 APR 1989	7635.50	19 0	10.7	-22-2-43.4	9.7330	10.0399	-27.9246	1.27	17.03	0.998	104.99
24 APR 1989	7640.50	19 0	13.8	-22-2-42.3	9.6533	10.0397	-27.1958	1.25	17.17	0.998	109.88
29 APR 1989	7645.50	19 0	6.5	-22-2-57.3	9.5761	10.0395	-26.2742	1.23	17.31	0.998	114.75
4 MAY 1989	7650.50	18 59	48.7	-22-3-28.0	9.5018	10.0394	-25.1462	1.22	17.44	0.998	119.67
9 MAY 1989	7655.50	18 59	20.7	-22-4-14.0	9.4311	10.0392	-23.8110	1.20	17.57	0.998	124.62
14 MAY 1989	7660.50	18 58	42.9	-22-5-15.0	9.3645	10.0390	-22.2880	1.19	17.70	0.998	129.60
19 MAY 1989	7665.50	18 57	55.7	-22-6-29.5	9.3025	10.0388	-20.5990	1.17	17.82	0.999	134.60
24 MAY 1989	7670.50	18 56	59.8	-22-7-56.6	9.2456	10.0386	-18.7578	1.16	17.93	0.999	139.62
29 MAY 1989	7675.50	18 55	55.7	-22-9-35.2	9.1943	10.0384	-16.7639	1.15	18.03	0.999	144.67
3 JUN 1989	7680.50	18 54	44.1	-22-11-23.5	9.1490	10.0382	-14.6163	1.14	18.11	0.999	149.74
8 JUN 1989	7685.50	18 53	25.9	-22-13-20.1	9.1100	10.0380	-12.3374	1.13	18.19	1.000	154.83
13 JUN 1989	7690.50	18 52	2.1	-22-15-23.2	9.0778	10.0378	-9.9609	1.12	18.26	1.000	159.93
18 JUN 1989	7695.50	18 50	33.8	-22-17-30.7	9.0526	10.0376	-7.5128	1.11	18.31	1.000	165.05
23 JUN 1989	7700.50	18 49	2.1	-22-19-41.4	9.0345	10.0374	-5.0087	1.11	18.34	1.000	170.17
28 JUN 1989	7705.50	18 47	27.9	-22-21-53.3	9.0237	10.0372	-2.4529	1.10	18.37	1.000	175.28
3 JUL 1989	7710.50	18 45	52.6	-22-24-4.7	9.0203	10.0370	0.1390	1.10	18.37	1.000	-179.23
8 JUL 1989	7715.50	18 44	17.3	-22-26-14.6	9.0245	10.0367	2.7284	1.11	18.36	1.000	-174.37
13 JUL 1989	7720.50	18 42	43.2	-22-28-21.2	9.0361	10.0365	5.2811	1.11	18.34	1.000	-169.26
18 JUL 1989	7725.50	18 41	11.8	-22-30-23.3	9.0549	10.0363	7.7763	1.11	18.30	1.000	-164.14

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1989	7730.50	18 39	43.8	-22-32-20.6	9.0809	10.0360	10.2043	1.12	18.25	1.000	-159.03
28 JUL 1989	7735.50	18 38	20.5	-22-34-11.5	9.1138	10.0358	12.5595	1.13	18.18	1.000	-153.94
2 AUG 1989	7740.50	18 37	3.0	-22-35-56.2	9.1534	10.0358	14.8185	1.14	18.11	0.999	-148.85
7 AUG 1989	7745.50	18 35	52.1	-22-37-33.8	9.1992	10.0353	16.9395	1.15	18.02	0.999	-143.79
12 AUG 1989	7750.50	18 34	48.8	-22-39-3.7	9.2510	10.0351	18.9083	1.16	17.91	0.999	-138.75
17 AUG 1989	7755.50	18 33	53.9	-22-40-28.3	9.3083	10.0348	20.7174	1.17	17.80	0.999	-133.74
22 AUG 1989	7760.50	18 33	7.8	-22-41-41.2	9.3705	10.0346	22.3690	1.19	17.69	0.998	-128.75
27 AUG 1989	7765.50	18 32	31.2	-22-42-48.0	9.4373	10.0343	23.8577	1.20	17.58	0.998	-123.79
1 SEP 1989	7770.50	18 32	4.5	-22-43-47.3	9.5081	10.0340	25.1599	1.22	17.43	0.998	-118.85
6 SEP 1989	7775.50	18 31	48.1	-22-44-38.3	9.5824	10.0338	26.2553	1.23	17.30	0.998	-113.94
11 SEP 1989	7780.50	18 31	42.2	-22-45-21.1	9.6596	10.0335	27.1430	1.25	17.16	0.998	-109.06
16 SEP 1989	7785.50	18 31	47.0	-22-45-55.9	9.7390	10.0332	27.8337	1.27	17.02	0.998	-104.21
21 SEP 1989	7790.50	18 32	2.4	-22-46-21.9	9.8202	10.0329	28.3368	1.29	16.88	0.998	-99.39
26 SEP 1989	7795.50	18 32	28.3	-22-46-39.4	9.9025	10.0326	28.6450	1.31	16.74	0.998	-94.60
1 OCT 1989	7800.50	18 33	4.8	-22-46-47.7	9.9854	10.0323	28.7439	1.32	16.60	0.998	-89.83
6 OCT 1989	7805.50	18 33	51.6	-22-46-46.4	10.0683	10.0321	28.6301	1.34	16.46	0.998	-85.08
11 OCT 1989	7810.50	18 34	48.5	-22-46-35.4	10.1506	10.0318	28.3177	1.36	16.33	0.998	-80.36
16 OCT 1989	7815.50	18 35	55.1	-22-46-13.9	10.2317	10.0315	27.8272	1.38	16.20	0.998	-75.67
21 OCT 1989	7820.50	18 37	11.0	-22-45-41.4	10.3111	10.0312	27.1656	1.39	16.07	0.998	-71.00
26 OCT 1989	7825.50	18 38	35.8	-22-44-58.0	10.3884	10.0308	26.3257	1.41	15.95	0.998	-66.34
31 OCT 1989	7830.50	18 40	9.1	-22-44-2.3	10.4630	10.0305	25.3036	1.42	15.84	0.998	-61.71
5 NOV 1989	7835.50	18 41	50.5	-22-42-54.3	10.5344	10.0302	24.1093	1.44	15.73	0.998	-57.09
10 NOV 1989	7840.50	18 43	39.3	-22-41-33.8	10.6021	10.0299	22.7672	1.45	15.63	0.998	-52.49
15 NOV 1989	7845.50	18 45	35.1	-22-39-59.8	10.6657	10.0296	21.2981	1.47	15.54	0.999	-47.91
20 NOV 1989	7850.50	18 47	37.3	-22-38-12.6	10.7250	10.0292	19.7029	1.48	15.45	0.999	-43.34
25 NOV 1989	7855.50	18 49	45.2	-22-36-11.7	10.7794	10.0289	17.9781	1.49	15.37	0.999	-38.78
30 NOV 1989	7860.50	18 51	58.4	-22-33-56.6	10.8287	10.0286	16.1307	1.50	15.30	0.999	-34.23
5 DEC 1989	7865.50	18 54	16.3	-22-31-28.0	10.8725	10.0282	14.1802	1.51	15.24	0.999	-29.69
10 DEC 1989	7870.50	18 56	38.1	-22-28-45.5	10.9105	10.0279	12.1558	1.52	15.19	1.000	-25.16
15 DEC 1989	7875.50	18 59	3.3	-22-25-49.4	10.9426	10.0276	10.0717	1.52	15.15	1.000	-20.64
20 DEC 1989	7880.50	19 1	31.2	-22-22-40.4	10.9686	10.0272	7.9243	1.53	15.11	1.000	-16.13
25 DEC 1989	7885.50	19 4	1.3	-22-19-18.4	10.9883	10.0269	5.7176	1.53	15.08	1.000	-11.61
30 DEC 1989	7890.50	19 6	32.9	-22-15-44.5	11.0016	10.0265	3.4670	1.53	15.06	1.000	-7.11

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	19 9	5.4	-22-11-59.8	11.0083	10.0281	1.1985	1.53	15.06	1.000	-2.61
9 JAN 1990	7900.50	19 11	38.0	-22 -8 -4.1	11.0085	10.0258	-1.0612	1.53	15.05	1.000	1.93
14 JAN 1990	7905.50	19 14	10.3	-22 -3-60.0	11.0022	10.0254	-3.3080	1.53	15.06	1.000	6.42
19 JAN 1990	7910.50	19 16	41.5	-21-59-47.8	10.9894	10.0250	-5.5450	1.53	15.08	1.000	10.92
24 JAN 1990	7915.50	19 19	11.1	-21-55-29.0	10.9702	10.0247	-7.7609	1.53	15.11	1.000	15.42
29 JAN 1990	7920.50	19 21	38.5	-21-51 -6.5	10.9446	10.0243	-9.9349	1.52	15.14	1.000	19.93
3 FEB 1990	7925.50	19 24	2.9	-21-46-38.6	10.9129	10.0239	-12.0394	1.51	15.19	1.000	24.44
8 FEB 1990	7930.50	19 26	23.9	-21-42-10.3	10.8752	10.0235	-14.0576	1.51	15.24	0.999	28.98
13 FEB 1990	7935.50	19 28	40.8	-21-37-42.7	10.8318	10.0231	-15.9938	1.50	15.30	0.999	33.48
18 FEB 1990	7940.50	19 30	53.1	-21-33-17.1	10.7829	10.0227	-17.8472	1.49	15.37	0.999	38.01
23 FEB 1990	7945.50	19 33	0.3	-21-28-55.9	10.7288	10.0223	-19.6017	1.48	15.45	0.999	42.55
28 FEB 1990	7950.50	19 35	1.7	-21-24-41.4	10.6698	10.0219	-21.2338	1.47	15.53	0.999	47.11
5 MAR 1990	7955.50	19 36	56.7	-21-20-35.2	10.6063	10.0215	-22.7216	1.45	15.63	0.998	51.67
10 MAR 1990	7960.50	19 38	44.9	-21-16-40.2	10.5387	10.0211	-24.0617	1.44	15.73	0.998	56.25
15 MAR 1990	7965.50	19 40	25.8	-21-12-58.0	10.4675	10.0207	-25.2621	1.42	15.83	0.998	60.84
20 MAR 1990	7970.50	19 41	59.0	-21 -9-30.3	10.3930	10.0203	-26.3177	1.41	15.95	0.998	65.45
25 MAR 1990	7975.50	19 43	23.9	-21 -6-19.9	10.3158	10.0199	-27.2095	1.39	16.07	0.998	70.08
30 MAR 1990	7980.50	19 44	40.2	-21 -3-28.2	10.2360	10.0194	-27.9161	1.37	16.19	0.998	74.73
4 APR 1990	7985.50	19 45	47.4	-21 0-57.3	10.1546	10.0190	-28.4285	1.36	16.32	0.998	79.40
9 APR 1990	7990.50	19 46	45.1	-20-58-49.0	10.0720	10.0186	-28.7551	1.34	16.45	0.998	84.09
14 APR 1990	7995.50	19 47	33.2	-20-57 -4.1	9.9887	10.0181	-28.9036	1.32	16.59	0.997	88.80
19 APR 1990	8000.50	19 48	11.5	-20-55-44.2	9.9052	10.0177	-28.8682	1.30	16.73	0.997	93.54
24 APR 1990	8005.50	19 48	39.6	-20-54-50.5	9.8222	10.0173	-28.6249	1.28	16.87	0.998	98.31
29 APR 1990	8010.50	19 48	57.3	-20-54-23.3	9.7401	10.0168	-28.1680	1.27	17.02	0.998	103.11
4 MAY 1990	8015.50	19 49	4.8	-20-54-23.8	9.6597	10.0164	-27.5040	1.25	17.16	0.998	107.94
9 MAY 1990	8020.50	19 49	1.8	-20-54-51.2	9.5814	10.0159	-26.6489	1.23	17.30	0.998	112.79
14 MAY 1990	8025.50	19 48	48.8	-20-55-45.5	9.5059	10.0154	-25.6105	1.21	17.43	0.998	117.67
19 MAY 1990	8030.50	19 48	25.7	-20-57 -6.4	9.4337	10.0150	-24.3826	1.20	17.57	0.998	122.58
24 MAY 1990	8035.50	19 47	52.8	-20-58-52.5	9.3653	10.0145	-22.9547	1.18	17.70	0.998	127.53
29 MAY 1990	8040.50	19 47	10.5	-21 -1 -3.0	9.3013	10.0140	-21.3348	1.17	17.82	0.999	132.50
3 JUN 1990	8045.50	19 46	19.3	-21 -3-35.1	9.2423	10.0136	-19.5482	1.15	17.93	0.999	137.49
8 JUN 1990	8050.50	19 45	19.8	-21 -6-29.1	9.1866	10.0131	-17.6162	1.14	18.04	0.999	142.52
13 JUN 1990	8055.50	19 44	12.7	-21 -9-40.4	9.1406	10.0126	-15.6498	1.13	18.13	0.999	147.56
18 JUN 1990	8060.50	19 42	58.7	-21-13 -7.4	9.0989	10.0121	-13.3483	1.12	18.21	0.999	152.63
23 JUN 1990	8065.50	19 41	38.8	-21-16-47.1	9.0637	10.0116	-11.0179	1.11	18.29	1.000	157.72
28 JUN 1990	8070.50	19 40	13.8	-21-20-37.1	9.0354	10.0112	-8.5889	1.10	18.34	1.000	162.83
3 JUL 1990	8075.50	19 38	44.8	-21-24-33.7	9.0141	10.0107	-6.0968	1.10	18.39	1.000	167.95
8 JUL 1990	8080.50	19 37	13.1	-21-28-33.9	9.0002	10.0102	-3.5631	1.09	18.41	1.000	173.07
13 JUL 1990	8085.50	19 35	39.7	-21-32-35.3	8.9936	10.0097	-1.0010	1.09	18.43	1.000	178.21
18 JUL 1990	8090.50	19 34	5.7	-21-36-34.5	8.9944	10.0091	1.5830	1.09	18.43	1.000	-176.65

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	19 32	32.4	-21-40-29.1	9.0027	10.0086	4.1686	1.09	18.41	1.000	-171.51
28 JUL 1990	8100.50	19 31	0.9	-21-44-16.4	9.0184	10.0081	6.7085	1.10	18.38	1.000	-166.37
2 AUG 1990	8105.50	19 29	32.5	-21-47-53.6	9.0414	10.0076	9.1787	1.10	18.33	1.000	-161.24
7 AUG 1990	8110.50	19 28	8.3	-21-51-19.0	9.0714	10.0071	11.5629	1.11	18.27	1.000	-158.13
12 AUG 1990	8115.50	19 26	49.3	-21-54-30.9	9.1081	10.0066	13.8545	1.12	18.20	0.999	-151.02
17 AUG 1990	8120.50	19 25	36.5	-21-57-27.3	9.1513	10.0060	16.0443	1.13	18.11	0.999	-145.94
22 AUG 1990	8125.50	19 24	30.7	-22 0 -7.4	9.2006	10.0055	18.1037	1.14	18.01	0.999	-140.86
27 AUG 1990	8130.50	19 23	32.9	-22 -2-29.5	9.2557	10.0050	20.0003	1.15	17.91	0.999	-135.82
1 SEP 1990	8135.50	19 22	43.8	-22 -4-32.8	9.3160	10.0044	21.7220	1.17	17.79	0.999	-130.79
6 SEP 1990	8140.50	19 22	3.9	-22 -6-17.0	9.3810	10.0039	23.2695	1.18	17.67	0.998	-125.79
11 SEP 1990	8145.50	19 21	33.7	-22 -7-41.1	9.4502	10.0033	24.6455	1.20	17.54	0.998	-120.82
16 SEP 1990	8150.50	19 21	13.6	-22 -8-45.2	9.5231	10.0028	25.8409	1.21	17.40	0.998	-115.87
21 SEP 1990	8155.50	19 21	3.8	-22 -9-28.7	9.5993	10.0022	26.8325	1.23	17.27	0.998	-110.95
26 SEP 1990	8160.50	19 21	4.6	-22 -9-51.0	9.6779	10.0017	27.6073	1.25	17.12	0.998	-106.06
1 OCT 1990	8165.50	19 21	16.1	-22 -9-52.5	9.7585	10.0011	28.1714	1.27	16.98	0.998	-101.19
6 OCT 1990	8170.50	19 21	38.1	-22 -9-32.9	9.8404	10.0005	28.5392	1.29	16.84	0.998	-96.36
11 OCT 1990	8175.50	19 22	10.7	-22 -8-52.0	9.9231	10.0000	28.7169	1.30	16.70	0.998	-91.55
16 OCT 1990	8180.50	19 22	53.5	-22 -7-50.3	10.0061	9.9994	28.6950	1.32	16.58	0.998	-86.77
21 OCT 1990	8185.50	19 23	46.5	-22 -6-27.0	10.0887	9.9988	28.4624	1.34	16.43	0.998	-82.01
26 OCT 1990	8190.50	19 24	49.3	-22 -4-42.5	10.1703	9.9983	28.0233	1.36	16.30	0.998	-77.27
31 OCT 1990	8195.50	19 26	1.5	-22 -2-37.0	10.2503	9.9977	27.3971	1.37	16.17	0.998	-72.56
5 NOV 1990	8200.50	19 27	22.7	-22 0-10.2	10.3283	9.9971	26.6035	1.39	16.05	0.998	-67.87
10 NOV 1990	8205.50	19 28	52.5	-21-57-22.7	10.4038	9.9965	25.6453	1.41	15.93	0.998	-63.21
15 NOV 1990	8210.50	19 30	30.2	-21-54-14.5	10.4763	9.9959	24.5152	1.42	15.82	0.998	-58.56
20 NOV 1990	8215.50	19 32	15.7	-21-50-45.4	10.5452	9.9953	23.2153	1.43	15.72	0.998	-53.93
25 NOV 1990	8220.50	19 34	8.2	-21-46-58.3	10.6102	9.9947	21.7621	1.45	15.62	0.999	-49.31
30 NOV 1990	8225.50	19 36	7.1	-21-42-47.4	10.6708	9.9941	20.1819	1.46	15.53	0.999	-44.72
5 DEC 1990	8230.50	19 38	11.8	-21-38-19.1	10.7267	9.9935	18.4919	1.47	15.45	0.999	-40.14
10 DEC 1990	8235.50	19 40	21.8	-21-33-32.5	10.7775	9.9929	16.6895	1.48	15.38	0.999	-35.57
15 DEC 1990	8240.50	19 42	36.5	-21-28-27.5	10.8230	9.9923	14.7740	1.49	15.31	0.999	-31.02
20 DEC 1990	8245.50	19 44	55.3	-21-23 -5.4	10.8627	9.9916	12.7590	1.50	15.26	1.000	-26.47
25 DEC 1990	8250.50	19 47	17.6	-21-17-27.4	10.8968	9.9910	10.6682	1.50	15.21	1.000	-21.94
30 DEC 1990	8255.50	19 49	42.6	-21-11-34.0	10.9243	9.9904	8.5289	1.51	15.17	1.000	-17.42

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1991	8260.50	19 52	9.8	-21 -5-27.2	10.9458	9.9898	6.3500	1.51	15.14	1.000	-12.91
9 JAN 1991	8265.50	19 54	38.5	-20-59 -7.9	10.9609	9.9891	4.1267	1.52	15.12	1.000	-8.40
14 JAN 1991	8270.50	19 57	8.2	-20-52-37.3	10.9696	9.9885	1.8677	1.52	15.11	1.000	-3.90
19 JAN 1991	8275.50	19 59	38.4	-20-45-57.7	10.9717	9.9878	-0.4067	1.52	15.11	1.000	0.63
24 JAN 1991	8280.50	20 2	8.1	-20-39-10.6	10.9673	9.9872	-2.6897	1.52	15.11	1.000	5.10
29 JAN 1991	8285.50	20 4	37.0	-20-32-17.6	10.9663	9.9866	-4.9001	1.52	15.13	1.000	9.59
3 FEB 1991	8290.50	20 7	4.3	-20-25-21.6	10.9390	9.9859	-7.0988	1.51	15.16	1.000	14.08
8 FEB 1991	8295.50	20 9	29.6	-20-18-23.6	10.9153	9.9852	-9.2671	1.51	15.18	1.000	18.57
13 FEB 1991	8300.50	20 11	52.3	-20-11-26.2	10.8856	9.9846	-11.3897	1.50	15.22	1.000	23.06
18 FEB 1991	8305.50	20 14	11.7	-20 -4-32.1	10.8496	9.9839	-13.4430	1.49	15.28	0.999	27.55
23 FEB 1991	8310.50	20 16	27.3	-19-57-43.3	10.8080	9.9833	-15.4027	1.49	15.33	0.999	32.05
28 FEB 1991	8315.50	20 18	38.5	-19-51 -2.8	10.7608	9.9826	-17.2592	1.48	15.40	0.999	36.55
5 MAR 1991	8320.50	20 20	44.7	-19-44-32.6	10.7084	9.9819	-19.0194	1.46	15.48	0.999	41.06
10 MAR 1991	8325.50	20 22	45.6	-19-38-16.0	10.6510	9.9812	-20.6794	1.45	15.58	0.999	45.58
15 MAR 1991	8330.50	20 24	40.5	-19-32-13.1	10.5890	9.9806	-22.2194	1.44	15.65	0.999	50.11
20 MAR 1991	8335.50	20 26	29.0	-19-26-29.1	10.5228	9.9799	-23.6165	1.43	15.75	0.998	54.65
25 MAR 1991	8340.50	20 28	10.5	-19-21 -5.7	10.4528	9.9792	-24.8551	1.41	15.86	0.998	59.21
30 MAR 1991	8345.50	20 29	44.8	-19-16 -5.5	10.3794	9.9785	-25.9380	1.40	15.97	0.998	63.77
4 APR 1991	8350.50	20 31	10.9	-19-11-30.2	10.3031	9.9778	-26.8727	1.38	16.09	0.998	68.36
9 APR 1991	8355.50	20 32	29.0	-19 -7-22.4	10.2244	9.9771	-27.6501	1.36	16.21	0.998	72.96
14 APR 1991	8360.50	20 33	38.4	-19 -3-44.3	10.1436	9.9764	-28.2495	1.35	16.34	0.998	77.59
19 APR 1991	8365.50	20 34	38.9	-19 0-37.6	10.0614	9.9757	-28.6534	1.33	16.47	0.998	82.24
24 APR 1991	8370.50	20 36	30.1	-18-58 -4.5	9.9783	9.9750	-28.8602	1.31	16.61	0.997	86.92
29 APR 1991	8375.50	20 38	11.7	-18-56 -5.9	9.8949	9.9743	-28.8816	1.29	16.75	0.997	91.61
4 MAY 1991	8380.50	20 36	43.6	-18-54-42.9	9.8117	9.9736	-28.7225	1.27	16.89	0.997	96.34
9 MAY 1991	8385.50	20 37	5.7	-18-53-56.8	9.7292	9.9729	-28.3720	1.25	17.03	0.998	101.09
14 MAY 1991	8390.50	20 37	17.7	-18-53-47.9	9.6480	9.9721	-27.8132	1.24	17.18	0.998	105.88
19 MAY 1991	8395.50	20 37	19.6	-18-54-16.4	9.5688	9.9714	-27.0415	1.22	17.32	0.998	110.70
24 MAY 1991	8400.50	20 37	11.5	-18-55-22.5	9.4920	9.9707	-26.0720	1.20	17.46	0.998	115.54
29 MAY 1991	8405.50	20 36	53.7	-18-57 -4.5	9.4184	9.9700	-24.9212	1.18	17.60	0.998	120.42
3 JUN 1991	8410.50	20 36	26.2	-18-59-21.8	9.3483	9.9692	-23.5932	1.17	17.73	0.998	125.32
8 JUN 1991	8415.50	20 35	49.4	-19 -2-13.1	9.2823	9.9685	-22.0815	1.15	17.85	0.998	130.26
13 JUN 1991	8420.50	20 35	3.7	-19 -5-36.0	9.2209	9.9677	-20.3806	1.14	17.97	0.999	135.23
18 JUN 1991	8425.50	20 34	9.5	-19 -9-28.6	9.1647	9.9670	-18.5670	1.12	18.08	0.999	140.23
23 JUN 1991	8430.50	20 33	7.6	-19-13-47.4	9.1142	9.9662	-16.4904	1.11	18.18	0.999	145.26
28 JUN 1991	8435.50	20 31	58.6	-19-18-29.0	9.0696	9.9655	-14.3496	1.10	18.27	0.999	150.31
3 JUL 1991	8440.50	20 30	43.4	-19-23-30.5	9.0314	9.9647	-12.0928	1.09	18.35	1.000	155.38
8 JUL 1991	8445.50	20 29	22.7	-19-28-47.8	8.9999	9.9640	-9.7226	1.08	18.41	1.000	160.47
13 JUL 1991	8450.50	20 27	57.7	-19-34-16.9	8.9754	9.9632	-7.2522	1.08	18.47	1.000	165.59
18 JUL 1991	8455.50	20 26	29.3	-19-39-53.8	8.9581	9.9624	-4.7184	1.07	18.50	1.000	170.71

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1991	8460.50	20 24	58.7	-19-45-33.5	8.9481	9.9617	-2.1558	1.07	18.52	1.000	175.84
28 JUL 1991	8465.50	20 23	27.0	-19-51-12.4	8.9456	9.9609	0.4186	1.07	18.53	1.000	-178.88
2 AUG 1991	8470.50	20 21	55.4	-19-58-46.5	8.9506	9.9601	2.9934	1.07	18.52	1.000	-173.82
7 AUG 1991	8475.50	20 20	25.1	-20 -2-11.5	8.9629	9.9594	5.5584	1.07	18.49	1.000	-168.68
12 AUG 1991	8480.50	20 18	57.1	-20 -7-24.3	8.9826	9.9586	8.0851	1.08	18.45	1.000	-163.53
17 AUG 1991	8485.50	20 17	32.7	-20-12-20.6	9.0095	9.9578	10.5322	1.08	18.40	1.000	-158.39
22 AUG 1991	8490.50	20 16	13.0	-20-16-57.5	9.0434	9.9570	12.8759	1.09	18.33	0.999	-153.26
27 AUG 1991	8495.50	20 14	59.0	-20-21-12.6	9.0838	9.9562	15.1080	1.10	18.24	0.999	-148.14
1 SEP 1991	8500.50	20 13	51.5	-20-25 -3.2	9.1305	9.9554	17.2228	1.11	18.15	0.999	-143.04
6 SEP 1991	8505.50	20 12	51.4	-20-28-27.3	9.1831	9.9546	19.2072	1.13	18.05	0.999	-137.96
11 SEP 1991	8510.50	20 11	59.5	-20-31-23.4	9.2413	9.9538	21.0314	1.14	17.93	0.999	-132.89
16 SEP 1991	8515.50	20 11	16.6	-20-33-49.2	9.3044	9.9530	22.6686	1.15	17.81	0.998	-127.85
21 SEP 1991	8520.50	20 10	43.0	-20-35-44.4	9.3720	9.9522	24.1147	1.17	17.68	0.998	-122.84
26 SEP 1991	8525.50	20 10	19.2	-20-37 -8.0	9.4435	9.9514	25.3755	1.19	17.55	0.998	-117.85
1 OCT 1991	8530.50	20 10	6.6	-20-37-59.2	9.5184	9.9506	26.4522	1.20	17.41	0.998	-112.89
6 OCT 1991	8535.50	20 10	2.3	-20-38-18.2	9.5961	9.9498	27.3325	1.22	17.27	0.998	-107.95
11 OCT 1991	8540.50	20 10	9.4	-20-38 -4.1	9.6760	9.9489	27.9962	1.24	17.13	0.998	-103.04
16 OCT 1991	8545.50	20 10	27.1	-20-37-17.0	9.7576	9.9481	28.4381	1.26	16.98	0.998	-98.16
21 OCT 1991	8550.50	20 10	55.3	-20-35-57.5	9.8401	9.9473	28.6712	1.27	16.84	0.998	-93.31
26 OCT 1991	8555.50	20 11	33.6	-20-34 -5.3	9.9230	9.9465	28.7109	1.29	16.70	0.998	-88.49
31 OCT 1991	8560.50	20 12	22.0	-20-31-41.4	10.0057	9.9456	28.5598	1.31	16.56	0.998	-83.69
5 NOV 1991	8565.50	20 13	20.1	-20-28-45.9	10.0877	9.9448	28.2074	1.33	16.43	0.998	-78.92
10 NOV 1991	8570.50	20 14	27.8	-20-25-19.0	10.1684	9.9439	27.6485	1.34	16.30	0.998	-74.17
15 NOV 1991	8575.50	20 15	44.4	-20-21-21.8	10.2472	9.9431	26.8947	1.36	16.17	0.998	-69.45
20 NOV 1991	8580.50	20 17	9.6	-20-16-55.1	10.3236	9.9422	25.9688	1.38	16.05	0.998	-64.75
25 NOV 1991	8585.50	20 18	42.9	-20-11-59.5	10.3971	9.9414	24.8882	1.39	15.94	0.998	-60.07
30 NOV 1991	8590.50	20 20	23.7	-20 -6-36.5	10.4672	9.9405	23.6520	1.41	15.83	0.998	-55.42
5 DEC 1991	8595.50	20 22	11.7	-20 0-46.2	10.5335	9.9397	22.2546	1.42	15.73	0.999	-50.78
10 DEC 1991	8600.50	20 24	6.1	-19-54-30.1	10.5956	9.9388	20.7055	1.44	15.64	0.999	-46.16
15 DEC 1991	8605.50	20 26	6.5	-19-47-49.8	10.6530	9.9380	19.0262	1.44	15.56	0.999	-41.56
20 DEC 1991	8610.50	20 28	12.1	-19-40-46.1	10.7054	9.9371	17.2428	1.45	15.48	0.999	-36.98
25 DEC 1991	8615.50	20 30	22.5	-19-33-21.0	10.7525	9.9362	15.3681	1.46	15.41	0.999	-32.42
30 DEC 1991	8620.50	20 32	36.9	-19-25-35.8	10.7940	9.9354	13.3970	1.47	15.35	0.999	-27.87

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1992	8625.50	20 34 55.0	-19-17-31.7	10.8298	9.9345	11.3337	1.48	15.30	1.000	-23.33	
9 JAN 1992	8630.50	20 37 15.9	-19 -9-11.1	10.8594	9.9336	9.1976	1.48	15.26	1.000	-18.81	
14 JAN 1992	8635.50	20 39 39.1	-19 0-35.8	10.8828	9.9327	7.0142	1.49	15.23	1.000	-14.30	
19 JAN 1992	8640.50	20 42 4.0	-18-51-47.6	10.8999	9.9318	4.8070	1.49	15.20	1.000	-9.80	
24 JAN 1992	8645.50	20 44 29.9	-18-42-49.2	10.9106	9.9309	2.5800	1.49	15.19	1.000	-5.33	
29 JAN 1992	8650.50	20 46 56.3	-18-33-42.1	10.9148	9.9301	0.3286	1.49	15.18	1.000	-1.01	
3 FEB 1992	8655.50	20 49 22.7	-18-24-28.8	10.9125	9.9292	-1.9334	1.49	15.19	1.000	3.72	
8 FEB 1992	8660.50	20 51 48.3	-18-15-12.0	10.9036	9.9283	-4.1820	1.49	15.20	1.000	8.17	
13 FEB 1992	8665.50	20 54 12.7	-18 -5-54.1	10.8883	9.9274	-6.3926	1.49	15.22	1.000	12.63	
18 FEB 1992	8670.50	20 56 35.2	-17-56-38.0	10.8688	9.9265	-8.5501	1.48	15.25	1.000	17.09	
23 FEB 1992	8675.50	20 58 55.2	-17-47-26.2	10.8390	9.9256	-10.6591	1.48	15.29	1.000	21.55	
28 FEB 1992	8680.50	21 1 12.3	-17-38-20.9	10.8052	9.9246	-12.7187	1.47	15.34	1.000	26.01	
4 MAR 1992	8685.50	21 3 26.0	-17-29-25.5	10.7656	9.9237	-14.7087	1.46	15.39	0.999	30.48	
9 MAR 1992	8690.50	21 5 35.6	-17-20-42.7	10.7204	9.9228	-16.6052	1.45	15.46	0.999	34.95	
14 MAR 1992	8695.50	21 7 40.6	-17-12-15.3	10.6698	9.9219	-18.3893	1.44	15.53	0.999	39.42	
19 MAR 1992	8700.50	21 9 40.6	-17 -4 -6.7	10.6143	9.9210	-20.0577	1.43	15.61	0.999	43.90	
24 MAR 1992	8705.50	21 11 35.0	-16-56-18.7	10.5541	9.9201	-21.6180	1.42	15.70	0.999	48.39	
29 MAR 1992	8710.50	21 13 23.4	-16-48-54.7	10.4895	9.9191	-23.0624	1.41	15.80	0.998	52.89	
3 APR 1992	8715.50	21 15 5.4	-16-41-57.5	10.4210	9.9182	-24.3684	1.39	15.90	0.998	57.40	
8 APR 1992	8720.50	21 16 40.3	-16-35-29.7	10.3490	9.9173	-25.5156	1.38	16.01	0.998	61.93	
13 APR 1992	8725.50	21 18 7.9	-16-29-34.2	10.2738	9.9163	-26.4955	1.36	16.13	0.998	66.47	
18 APR 1992	8730.50	21 19 27.6	-16-24-13.2	10.1961	9.9154	-27.3150	1.34	16.25	0.998	71.03	
23 APR 1992	8735.50	21 20 39.3	-16-19-28.7	10.1162	9.9144	-27.9792	1.33	16.38	0.998	75.62	
28 APR 1992	8740.50	21 21 42.5	-16-15-23.2	10.0347	9.9135	-28.4761	1.31	16.52	0.997	80.22	
3 MAY 1992	8745.50	21 22 36.8	-16-11-58.6	9.9519	9.9126	-28.7817	1.29	16.65	0.997	84.85	
8 MAY 1992	8750.50	21 23 22.0	-16 -9-16.6	9.8866	9.9116	-28.8868	1.27	16.79	0.997	89.51	
13 MAY 1992	8755.50	21 23 57.9	-16 -7-18.9	9.7853	9.9106	-28.7958	1.25	16.94	0.997	94.19	
18 MAY 1992	8760.50	21 24 24.2	-16 -6 -5.7	9.7025	9.9097	-28.5214	1.23	17.08	0.997	98.90	
23 MAY 1992	8765.50	21 24 41.0	-16 -5-38.0	9.6207	9.9087	-28.0642	1.22	17.23	0.998	103.65	
28 MAY 1992	8770.50	21 24 48.0	-16 -5-58.4	9.5406	9.9078	-27.4116	1.20	17.37	0.998	108.42	
2 JUN 1992	8775.50	21 24 45.3	-16 -7 -0.4	9.4626	9.9068	-26.5496	1.18	17.51	0.998	113.23	
7 JUN 1992	8780.50	21 24 32.9	-16 -8-49.8	9.3875	9.9058	-25.4814	1.16	17.65	0.998	118.08	
12 JUN 1992	8785.50	21 24 11.1	-16-11-23.2	9.3156	9.9049	-24.2272	1.15	17.79	0.998	122.95	
17 JUN 1992	8790.50	21 23 40.1	-16-14-38.5	9.2477	9.9039	-22.8018	1.13	17.92	0.998	127.86	
22 JUN 1992	8795.50	21 23 0.2	-16-18-34.0	9.1841	9.9029	-21.2062	1.11	18.05	0.999	132.80	
27 JUN 1992	8800.50	21 22 11.8	-16-23 -7.1	9.1254	9.9019	-19.4351	1.10	18.16	0.999	137.78	
2 JUL 1992	8805.50	21 21 15.5	-16-28-14.5	9.0720	9.9009	-17.4900	1.09	18.27	0.999	142.78	
7 JUL 1992	8810.50	21 20 11.9	-16-33-52.8	9.0245	9.9000	-15.3953	1.08	18.36	0.999	147.82	
12 JUL 1992	8815.50	21 19 1.8	-16-39-57.2	8.9832	9.8990	-13.1827	1.07	18.45	0.999	152.88	
17 JUL 1992	8820.50	21 17 46.1	-16-46-23.4	8.9485	9.8980	-10.8675	1.06	18.52	1.000	157.96	

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1992	8825.50	21 16 25.5	-16-53	-7.0	8.9208	9.8970	-8.4588	1.05	18.58	1.000	163.07
27 JUL 1992	8830.50	21 15 1.1	-17 0	-2.6	8.8997	9.8980	-5.9576	1.04	18.62	1.000	168.19
1 AUG 1992	8835.50	21 13 33.8	-17 -7	-5.4	8.8862	9.8950	-3.3908	1.04	18.65	1.000	173.30
6 AUG 1992	8840.50	21 12 4.9	-17-14	-9.6	8.8802	9.8940	-0.7976	1.04	18.66	1.000	178.22
11 AUG 1992	8845.50	21 10 35.6	-17-21	-9.6	8.8816	9.8930	1.7907	1.04	18.66	1.000	-176.16
16 AUG 1992	8850.50	21 9 7.0	-17-28	-1.0	8.8905	9.8920	4.3614	1.04	18.64	1.000	-171.06
21 AUG 1992	8855.50	21 7 40.0	-17-34-38.4	8.9088	9.8909	9.8909	6.9038	1.04	18.61	1.000	-165.91
26 AUG 1992	8860.50	21 6 16.0	-17-40-57.4	8.9303	9.8899	9.8899	9.4024	1.05	18.58	1.000	-160.75
31 AUG 1992	8865.50	21 4 56.0	-17-46-53.8	8.9610	9.8889	9.8889	11.8245	1.06	18.49	1.000	-155.59
5 SEP 1992	8870.50	21 3 41.1	-17-52-22.7	8.9985	9.8879	9.8879	14.1314	1.07	18.42	0.999	-150.44
10 SEP 1992	8875.50	21 2 32.2	-17-57-21.2	9.0425	9.8869	9.8869	16.3068	1.08	18.33	0.999	-145.31
15 SEP 1992	8880.50	21 1 30.3	-18 -1-46.3	9.0926	9.8858	9.8858	18.3475	1.09	18.23	0.999	-140.19
20 SEP 1992	8885.50	21 0 36.0	-18 -5-36.1	9.1483	9.8848	9.8848	20.2469	1.10	18.12	0.999	-135.09
25 SEP 1992	8890.50	20 59 50.1	-18 -8-46.0	9.2093	9.8838	9.8838	21.9895	1.12	18.00	0.998	-130.01
30 SEP 1992	8895.50	20 59 13.1	-18-11-16.4	9.2751	9.8828	9.8828	23.5432	1.13	17.87	0.998	-124.95
5 OCT 1992	8900.50	20 58 45.8	-18-13 -5.0	9.3451	9.8817	9.8817	24.8921	1.15	17.73	0.998	-119.91
10 OCT 1992	8905.50	20 58 28.2	-18-14-11.4	9.4187	9.8807	9.8807	26.0389	1.16	17.60	0.998	-114.91
15 OCT 1992	8910.50	20 58 20.7	-18-14-34.6	9.4963	9.8798	9.8798	26.9919	1.18	17.45	0.998	-109.93
20 OCT 1992	8915.50	20 58 23.4	-18-14-14.6	9.5744	9.8786	9.8786	27.7501	1.20	17.31	0.998	-104.98
25 OCT 1992	8920.50	20 58 36.3	-18-13-11.5	9.6554	9.8775	9.8775	28.2993	1.22	17.16	0.998	-100.06
30 OCT 1992	8925.50	20 58 59.6	-18-11-24.8	9.7376	9.8765	9.8765	28.6246	1.24	17.02	0.997	-95.16
4 NOV 1992	8930.50	20 59 33.1	-18 -8-55.5	9.8205	9.8754	9.8754	28.7293	1.25	16.88	0.997	-90.30
9 NOV 1992	8935.50	21 0 16.5	-18 -5-44.4	9.9034	9.8744	9.8744	28.6313	1.27	16.73	0.997	-85.46
14 NOV 1992	8940.50	21 1 9.6	-18 -1-52.2	9.9857	9.8733	9.8733	28.3452	1.29	16.60	0.998	-80.66
19 NOV 1992	8945.50	21 2 12.0	-17-57-20.3	10.0669	9.8723	9.8723	27.8705	1.31	16.46	0.998	-75.87
24 NOV 1992	8950.50	21 3 23.4	-17-52 -9.3	10.1464	9.8712	9.8712	27.1973	1.32	16.33	0.998	-71.12
29 NOV 1992	8955.50	21 4 43.4	-17-46-20.6	10.2238	9.8701	9.8701	26.3280	1.34	16.21	0.998	-66.39
4 DEC 1992	8960.50	21 6 11.5	-17-39-58.0	10.2983	9.8691	9.8691	25.2807	1.36	16.09	0.998	-61.69
9 DEC 1992	8965.50	21 7 47.2	-17-32-56.8	10.3698	9.8680	9.8680	24.0792	1.37	15.98	0.998	-57.01
14 DEC 1992	8970.50	21 9 30.0	-17-25-25.1	10.4373	9.8669	9.8669	22.7379	1.38	15.88	0.998	-52.36
19 DEC 1992	8975.50	21 11 19.2	-17-17-22.4	10.5088	9.8658	9.8658	21.2528	1.40	15.78	0.999	-47.73
24 DEC 1992	8980.50	21 13 14.5	-17 -8-50.2	10.5599	9.8648	9.8648	19.6224	1.41	15.69	0.999	-43.11
29 DEC 1992	8985.50	21 15 15.1	-16-59-51.0	10.6140	9.8637	9.8637	17.8633	1.42	15.61	0.999	-38.52

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1993	8990.50	21 17 20.6	-16-50-26.9	10.6629	9.8626	16.0001	1.43	15.54	0.999	-33.95
8 JAN 1993	8995.50	21 19 30.2	-16-40-39.9	10.7063	9.8615	14.0584	1.44	15.48	0.999	-29.40
13 JAN 1993	9000.50	21 21 43.4	-16-30-32.9	10.7440	9.8604	12.0403	1.45	15.43	1.000	-24.87
18 JAN 1993	9005.50	21 23 59.7	-16-20-7.4	10.7758	9.8593	9.9463	1.45	15.38	1.000	-20.36
23 JAN 1993	9010.50	21 26 18.5	-16-9-26.2	10.8014	9.8582	7.7837	1.46	15.34	1.000	-15.86
28 JAN 1993	9015.50	21 28 39.1	-15-58-32.1	10.8207	9.8571	5.5769	1.46	15.32	1.000	-11.38
2 FEB 1993	9020.50	21 31 0.9	-15-47-27.5	10.8336	9.8560	3.3505	1.46	15.30	1.000	-6.93
7 FEB 1993	9025.50	21 33 23.4	-15-36-15.6	10.8401	9.8549	1.1228	1.46	15.29	1.000	-2.60
12 FEB 1993	9030.50	21 35 46.0	-15-24-59.0	10.8401	9.8538	-1.1066	1.46	15.29	1.000	2.32
17 FEB 1993	9035.50	21 38 8.2	-15-13-40.0	10.8337	9.8527	-3.3403	1.46	15.30	1.000	6.60
22 FEB 1993	9040.50	21 40 29.4	-15-2-22.0	10.8208	9.8516	-5.5596	1.46	15.32	1.000	11.02
27 FEB 1993	9045.50	21 42 49.0	-14-51-8.1	10.8018	9.8505	-7.7389	1.45	15.34	1.000	15.44
4 MAR 1993	9050.50	21 45 6.5	-14-40-1.1	10.7762	9.8494	-9.8578	1.45	15.38	1.000	19.86
9 MAR 1993	9055.50	21 47 21.4	-14-29-4.6	10.7447	9.8482	-11.9075	1.44	15.42	1.000	24.29
14 MAR 1993	9060.50	21 49 33.1	-14-18-20.9	10.7075	9.8471	-13.8946	1.43	15.48	0.999	28.71
19 MAR 1993	9065.50	21 51 41.3	-14-7-53.1	10.6646	9.8460	-15.8144	1.43	15.54	0.999	33.14
24 MAR 1993	9070.50	21 53 45.3	-13-57-44.8	10.6162	9.8449	-17.6433	1.42	15.61	0.999	37.58
29 MAR 1993	9075.50	21 55 44.6	-13-47-58.9	10.5628	9.8437	-19.3590	1.40	15.69	0.999	42.02
3 APR 1993	9080.50	21 57 38.8	-13-38-38.6	10.5045	9.8426	-20.9487	1.39	15.78	0.999	46.47
8 APR 1993	9085.50	21 59 27.4	-13-29-46.9	10.4419	9.8415	-22.4143	1.38	15.87	0.998	50.92
13 APR 1993	9090.50	22 1 10.0	-13-21-26.1	10.3752	9.8403	-23.7620	1.37	15.97	0.998	55.39
18 APR 1993	9095.50	22 2 46.1	-13-13-39.6	10.3048	9.8392	-24.9797	1.35	16.08	0.998	59.87
23 APR 1993	9100.50	22 4 15.3	-13-6-30.3	10.2311	9.8380	-26.0434	1.33	16.20	0.998	64.37
28 APR 1993	9105.50	22 5 37.2	-13-0-0.6	10.1545	9.8369	-26.9369	1.32	16.32	0.998	68.89
3 MAY 1993	9110.50	22 6 51.4	-12-54-13.5	10.0757	9.8358	-27.6582	1.30	16.45	0.998	73.43
8 MAY 1993	9115.50	22 7 57.5	-12-49-10.5	9.9950	9.8346	-28.2164	1.28	16.58	0.997	77.99
13 MAY 1993	9120.50	22 8 55.3	-12-44-53.8	9.9129	9.8335	-28.6128	1.26	16.72	0.997	82.57
18 MAY 1993	9125.50	22 9 44.4	-12-41-25.7	9.8299	9.8323	-28.8307	1.25	16.80	0.997	87.18
23 MAY 1993	9130.50	22 10 24.6	-12-38-47.5	9.7465	9.8311	-28.8509	1.23	17.00	0.997	91.83
28 MAY 1993	9135.50	22 10 55.6	-12-37-0.8	9.6634	9.8300	-28.6671	1.21	17.15	0.997	96.50
2 JUN 1993	9140.50	22 11 17.2	-12-36-6.2	9.5812	9.8288	-28.2903	1.19	17.30	0.997	101.20
7 JUN 1993	9145.50	22 11 29.5	-12-36-3.6	9.5002	9.8277	-27.7322	1.17	17.44	0.998	105.94
12 JUN 1993	9150.50	22 11 32.4	-12-36-53.5	9.4212	9.8265	-26.9891	1.15	17.59	0.998	110.71
17 JUN 1993	9155.50	22 11 25.8	-12-38-35.5	9.3445	9.8253	-26.0478	1.13	17.74	0.998	115.52
22 JUN 1993	9160.50	22 11 9.8	-12-41-8.5	9.2709	9.8241	-24.8995	1.12	17.88	0.998	120.37
27 JUN 1993	9165.50	22 10 44.7	-12-44-31.4	9.2009	9.8230	-23.5547	1.10	18.01	0.998	125.26
2 JUL 1993	9170.50	22 10 10.7	-12-48-41.2	9.1351	9.8218	-22.0372	1.08	18.14	0.998	130.17
7 JUL 1993	9175.50	22 9 28.3	-12-53-35.4	9.0738	9.8206	-20.3586	1.07	18.26	0.999	135.13
12 JUL 1993	9180.50	22 8 37.8	-12-59-11.0	9.0176	9.8194	-18.5179	1.06	18.38	0.999	140.11
17 JUL 1993	9185.50	22 7 39.8	-13-5-24.0	8.9670	9.8183	-16.5134	1.04	18.48	0.999	145.14

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1993	9190.50	22 6 34.9	-13-12-10.5	8.9224	9.8171	-14.3542	1.03	18.57	0.999	150.19
27 JUL 1993	9195.50	22 5 24.0	-13-19-25.1	8.8842	9.8159	-12.0718	1.02	18.65	1.000	155.27
1 AUG 1993	9200.50	22 4 8.0	-13-27-2.0	8.8528	9.8147	-9.6973	1.01	18.72	1.000	160.37
6 AUG 1993	9205.50	22 2 47.7	-13-34-56.1	8.8283	9.8135	-7.2428	1.01	18.77	1.000	165.48
11 AUG 1993	9210.50	22 1 24.0	-13-43-1.5	8.8110	9.8123	-4.7157	1.00	18.81	1.000	170.60
16 AUG 1993	9215.50	21 59 58.2	-13-51-12.0	8.8011	9.8111	-2.1289	1.00	18.83	1.000	175.62
21 AUG 1993	9220.50	21 58 31.1	-13-59-21.7	8.7988	9.8099	0.4894	1.00	18.84	1.000	178.13
26 AUG 1993	9225.50	21 57 4.2	-14-7-23.5	8.8039	9.8087	3.0984	1.00	18.82	1.000	173.54
31 AUG 1993	9230.50	21 55 38.4	-14-15-11.8	8.8168	9.8075	5.6856	1.00	18.80	1.000	168.42
5 SEP 1993	9235.50	21 54 14.9	-14-22-41.0	8.8388	9.8063	8.1883	1.01	18.76	1.000	163.25
10 SEP 1993	9240.50	21 52 54.8	-14-29-45.6	8.8638	9.8051	10.6525	1.02	18.70	1.000	158.07
15 SEP 1993	9245.50	21 51 39.0	-14-36-20.8	8.8981	9.8039	13.0376	1.02	18.63	0.999	152.89
20 SEP 1993	9250.50	21 50 28.7	-14-42-21.5	8.9390	9.8027	15.3088	1.03	18.54	0.999	147.72
25 SEP 1993	9255.50	21 49 24.9	-14-47-43.4	8.9863	9.8014	17.4327	1.04	18.44	0.999	142.56
30 SEP 1993	9260.50	21 48 28.2	-14-52-23.3	9.0398	9.8002	19.4008	1.06	18.33	0.999	137.42
5 OCT 1993	9265.50	21 47 39.4	-14-56-18.3	9.0982	9.7990	21.2132	1.07	18.22	0.999	132.29
10 OCT 1993	9270.50	21 46 59.2	-14-59-26.0	9.1619	9.7978	22.8617	1.09	18.09	0.998	127.19
15 OCT 1993	9275.50	21 46 28.0	-15-1-44.5	9.2301	9.7966	24.3271	1.10	17.96	0.998	122.11
20 OCT 1993	9280.50	21 46 6.3	-15-3-11.7	9.3022	9.7953	25.5838	1.12	17.82	0.998	117.06
25 OCT 1993	9285.50	21 45 54.5	-15-3-47.2	9.3776	9.7941	26.6220	1.14	17.67	0.998	112.04
30 OCT 1993	9290.50	21 45 52.6	-15-3-30.5	9.4558	9.7929	27.4520	1.15	17.53	0.998	107.05
4 NOV 1993	9295.50	21 46 0.8	-15-2-21.6	9.5360	9.7916	28.0828	1.17	17.38	0.998	102.08
9 NOV 1993	9300.50	21 46 19.1	-15-0-21.0	9.6178	9.7904	28.5108	1.19	17.23	0.997	97.15
14 NOV 1993	9305.50	21 46 47.3	-14-57-29.0	9.7005	9.7892	28.7220	1.21	17.08	0.997	92.24
19 NOV 1993	9310.50	21 47 25.5	-14-53-46.1	9.7834	9.7879	28.7083	1.23	16.94	0.997	87.37
24 NOV 1993	9315.50	21 48 13.3	-14-49-14.2	9.8661	9.7867	28.4816	1.24	16.80	0.997	82.53
29 NOV 1993	9320.50	21 49 10.4	-14-43-54.4	9.9477	9.7854	28.0624	1.26	16.66	0.998	77.72
4 DEC 1993	9325.50	21 50 16.4	-14-37-48.8	10.0280	9.7842	27.4633	1.28	16.53	0.998	72.94
9 DEC 1993	9330.50	21 51 30.9	-14-30-59.0	10.1062	9.7829	26.6811	1.30	16.40	0.998	68.18
14 DEC 1993	9335.50	21 52 53.6	-14-23-26.4	10.1819	9.7817	25.7089	1.31	16.28	0.998	63.46
19 DEC 1993	9340.50	21 54 24.0	-14-15-13.6	10.2545	9.7804	24.5589	1.33	16.16	0.998	58.76
24 DEC 1993	9345.50	21 56 1.5	-14-6-23.0	10.3235	9.7792	23.2482	1.34	16.05	0.998	54.09
29 DEC 1993	9350.50	21 57 45.5	-13-56-56.8	10.3886	9.7779	21.8057	1.35	15.95	0.999	49.45

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	21 59 35.6	-13-46-57.9	10.4494	9.7766	20.2395	1.37	15.86	0.999		-44.83
8 JAN 1994	9360.50	22 1 31.1	-13-36-28.4	10.5054	9.7754	18.5446	1.38	15.78	0.999		-40.24
13 JAN 1994	9365.50	22 3 31.7	-13-25-30.7	10.5583	9.7741	16.7245	1.39	15.70	0.999		-35.67
18 JAN 1994	9370.50	22 5 36.6	-13-14 -8.1	10.6019	9.7729	14.8020	1.40	15.63	0.999		-31.12
23 JAN 1994	9375.50	22 7 45.2	-13 -2-23.4	10.6418	9.7716	12.8024	1.40	15.57	0.999		-26.60
28 JAN 1994	9380.50	22 9 57.1	-12-50-19.6	10.6758	9.7703	10.7453	1.41	15.52	1.000		-22.10
2 FEB 1994	9385.50	22 12 11.5	-12-37-59.6	10.7038	9.7690	8.6343	1.42	15.48	1.000		-17.62
7 FEB 1994	9390.50	22 14 28.1	-12-25-26.0	10.7256	9.7678	6.4649	1.42	15.45	1.000		-13.16
12 FEB 1994	9395.50	22 16 46.2	-12-12-42.1	10.7411	9.7665	4.2519	1.42	15.43	1.000		-8.74
17 FEB 1994	9400.50	22 19 5.2	-11-59-51.1	10.7501	9.7652	2.0225	1.43	15.42	1.000		-4.41
22 FEB 1994	9405.50	22 21 24.6	-11-46-56.3	10.7528	9.7639	-0.2016	1.43	15.41	1.000		-1.45
27 FEB 1994	9410.50	22 23 43.8	-11-34 -1.1	10.7490	9.7626	-2.4080	1.42	15.42	1.000		4.89
4 MAR 1994	9415.50	22 26 2.3	-11-21 -8.1	10.7389	9.7614	-4.6001	1.42	15.43	1.000		9.20
9 MAR 1994	9420.50	22 28 19.7	-11 -8-20.5	10.7224	9.7601	-6.7773	1.42	15.46	1.000		13.57
14 MAR 1994	9425.50	22 30 35.3	-10-55-42.0	10.6998	9.7588	-8.9168	1.41	15.49	1.000		17.96
19 MAR 1994	9430.50	22 32 48.7	-10-43-15.6	10.6710	9.7575	-10.9931	1.41	15.53	1.000		22.34
24 MAR 1994	9435.50	22 34 59.3	-10-31 -4.9	10.6363	9.7562	-12.9919	1.40	15.58	0.999		26.72
29 MAR 1994	9440.50	22 37 6.8	-10-19-13.1	10.5960	9.7549	-14.9097	1.39	15.64	0.999		31.11
3 APR 1994	9445.50	22 39 10.3	-10 -7-42.8	10.5503	9.7536	-16.7630	1.38	15.71	0.999		35.49
8 APR 1994	9450.50	22 41 9.8	-9-56-37.5	10.4994	9.7523	-18.5128	1.37	15.78	0.999		39.89
13 APR 1994	9455.50	22 43 4.5	-9-46 -0.6	10.4435	9.7510	-20.1634	1.36	15.87	0.999		44.29
18 APR 1994	9460.50	22 44 54.2	-9-35-55.1	10.3830	9.7497	-21.6857	1.35	15.96	0.998		48.71
23 APR 1994	9465.50	22 46 38.1	-9-26-24.3	10.3184	9.7484	-23.0729	1.33	16.06	0.998		53.13
28 APR 1994	9470.50	22 48 16.1	-9-17-30.7	10.2499	9.7471	-24.3305	1.32	16.17	0.998		57.56
3 MAY 1994	9475.50	22 49 47.7	-9 -9-16.9	10.1780	9.7458	-25.4614	1.30	16.28	0.998		62.02
8 MAY 1994	9480.50	22 51 12.4	-9 -1-46.2	10.1030	9.7445	-26.4491	1.29	16.40	0.998		66.49
13 MAY 1994	9485.50	22 52 29.8	-8-55 -1.1	10.0254	9.7432	-27.2702	1.27	16.53	0.998		70.98
18 MAY 1994	9490.50	22 53 39.6	-8-49 -4.1	9.9457	9.7418	-27.9134	1.25	16.66	0.997		75.50
23 MAY 1994	9495.50	22 54 41.3	-8-43-57.6	9.8643	9.7405	-28.3823	1.23	16.80	0.997		80.04
28 MAY 1994	9500.50	22 55 34.8	-8-39-42.6	9.7819	9.7392	-28.6860	1.21	16.94	0.997		84.61
2 JUN 1994	9505.50	22 56 19.8	-8-36-21.5	9.6988	9.7379	-28.8207	1.20	17.09	0.997		89.21
7 JUN 1994	9510.50	22 56 55.9	-8-33-55.7	9.6156	9.7366	-28.7677	1.18	17.24	0.997		93.84
12 JUN 1994	9515.50	22 57 23.0	-8-32-26.3	9.5329	9.7352	-28.5110	1.16	17.39	0.997		98.51
17 JUN 1994	9520.50	22 57 40.8	-8-31-54.3	9.4511	9.7339	-28.0508	1.14	17.54	0.997		103.22
22 JUN 1994	9525.50	22 57 49.4	-8-32-19.2	9.3710	9.7326	-27.4017	1.12	17.69	0.998		107.96
27 JUN 1994	9530.50	22 57 48.8	-8-33-40.7	9.2931	9.7313	-26.5727	1.10	17.83	0.998		112.73
2 JUL 1994	9535.50	22 57 38.9	-8-35-58.5	9.2178	9.7299	-25.5564	1.08	17.98	0.998		117.55
7 JUL 1994	9540.50	22 57 19.8	-8-39-11.1	9.1457	9.7286	-24.3411	1.07	18.12	0.998		122.41
12 JUL 1994	9545.50	22 56 51.9	-8-43-16.9	9.0774	9.7273	-22.9246	1.05	18.26	0.998		127.30
17 JUL 1994	9550.50	22 56 15.2	-8-48-13.2	9.0134	9.7259	-21.3241	1.03	18.39	0.998		132.24

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (^{''})	PHASE	ELONG
22 JUL 1994	9555.50	22 55 30.4	-8-53-58.1	8.9544	9.7246	-19.5849	1.02	18.51	0.999	137.21	
27 JUL 1994	9560.50	22 54 38.0	-9 0-22.3	8.9006	9.7232	-17.6551	1.01	18.62	0.999	142.22	
1 AUG 1994	9565.50	22 53 38.3	-9 7-27.6	8.8525	9.7219	-15.5933	0.99	18.72	0.999	147.26	
6 AUG 1994	9570.50	22 52 32.2	-9-15-6.9	8.8107	9.7205	-13.3833	0.98	18.81	0.999	152.34	
11 AUG 1994	9575.50	22 51 20.4	-9-23-15.0	8.7754	9.7192	-11.0427	0.97	18.89	1.000	157.44	
16 AUG 1994	9580.50	22 50 3.9	-9-31-45.2	8.7470	9.7179	-8.6074	0.97	18.95	1.000	162.56	
21 AUG 1994	9585.50	22 48 43.6	-9-40-31.0	8.7257	9.7165	-6.1070	0.96	18.99	1.000	167.68	
26 AUG 1994	9590.50	22 47 20.4	-9-49-26.3	8.7118	9.7152	-3.5503	0.96	19.02	1.000	172.75	
31 AUG 1994	9595.50	22 45 55.6	-9-58-24.1	8.7053	9.7138	-0.9470	0.96	19.04	1.000	177.35	
5 SEP 1994	9600.50	22 44 30.0	-10 7-17.8	8.7063	9.7125	1.6832	0.96	19.04	1.000	-176.02	
10 SEP 1994	9605.50	22 43 4.9	-10-16-0.3	8.7150	9.7111	4.3063	0.96	19.02	1.000	-171.09	
15 SEP 1994	9610.50	22 41 41.6	-10-24-24.3	8.7311	9.7097	6.8808	0.96	18.98	1.000	-165.94	
20 SEP 1994	9615.50	22 40 21.0	-10-32-23.8	8.7546	9.7084	9.3861	0.97	18.93	1.000	-160.75	
25 SEP 1994	9620.50	22 39 4.2	-10-39-53.0	8.7853	9.7070	11.8164	0.97	18.86	1.000	-155.54	
30 SEP 1994	9625.50	22 37 52.3	-10-46-48.3	8.8228	9.7057	14.1570	0.98	18.78	0.999	-150.33	
5 OCT 1994	9630.50	22 36 46.1	-10-52-58.9	8.8669	9.7043	16.3832	0.99	18.69	0.999	-145.13	
10 OCT 1994	9635.50	22 35 46.6	-10-58-25.7	8.9173	9.7029	18.4604	1.01	18.59	0.999	-139.95	
15 OCT 1994	9640.50	22 34 54.6	-11 3-2.9	8.9734	9.7016	20.3632	1.02	18.47	0.999	-134.78	
20 OCT 1994	9645.50	22 34 10.8	-11 6-47.7	9.0347	9.7002	22.0899	1.03	18.34	0.998	-129.64	
25 OCT 1994	9650.50	22 33 35.6	-11 9-37.6	9.1008	9.6988	23.6428	1.05	18.21	0.998	-124.52	
30 OCT 1994	9655.50	22 33 9.6	-11-11-31.0	9.1711	9.6975	25.0113	1.07	18.07	0.998	-119.42	
4 NOV 1994	9660.50	22 32 53.0	-11-12-26.1	9.2451	9.6961	26.1752	1.08	17.93	0.998	-114.35	
9 NOV 1994	9665.50	22 32 46.4	-11-12-21.7	9.3221	9.6947	27.1150	1.10	17.78	0.998	-109.31	
14 NOV 1994	9670.50	22 32 49.6	-11-11-18.2	9.4014	9.6933	27.8303	1.12	17.63	0.998	-104.31	
19 NOV 1994	9675.50	22 33 2.7	-11 9-15.7	9.4826	9.6920	28.3359	1.14	17.48	0.997	-99.33	
24 NOV 1994	9680.50	22 33 25.8	-11 6-15.2	9.5649	9.6906	28.6405	1.16	17.33	0.997	-94.39	
29 NOV 1994	9685.50	22 33 58.5	-11 2-17.8	9.6478	9.6892	28.7380	1.17	17.18	0.997	-89.49	
4 DEC 1994	9690.50	22 34 40.9	-10-57-24.2	9.7307	9.6878	28.6165	1.19	17.03	0.997	-84.61	
9 DEC 1994	9695.50	22 35 32.7	-10-51-36.3	9.8129	9.6864	28.2764	1.21	16.89	0.997	-79.77	
14 DEC 1994	9700.50	22 36 33.4	-10-44-56.5	9.8938	9.6850	27.7363	1.23	16.75	0.998	-74.96	
19 DEC 1994	9705.50	22 37 42.7	-10-37-26.9	9.9729	9.6837	27.0174	1.24	16.62	0.998	-70.19	
24 DEC 1994	9710.50	22 39 0.1	-10-29-10.3	10.0497	9.6823	26.1294	1.26	16.49	0.998	-65.44	
29 DEC 1994	9715.50	22 40 25.2	-10-20-8.7	10.1236	9.6809	25.0675	1.28	16.37	0.998	-60.73	

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1995	9720.50	22 41	57.7	-10-10-24.6	10.1943	9.6795	23.8298	1.29	16.28	0.998	-58.05
8 JAN 1995	9726.50	22 43	36.9	-10 0 -1.5	10.2611	9.6781	22.4332	1.30	16.15	0.998	-51.40
13 JAN 1995	9730.50	22 45	22.2	-9-49 -2.1	10.3237	9.6767	20.9042	1.32	16.05	0.999	-46.78
18 JAN 1995	9735.50	22 47	13.3	-9-37-29.7	10.3817	9.6753	19.2824	1.33	15.96	0.999	-42.18
23 JAN 1995	9740.50	22 49	9.3	-9-25-27.6	10.4348	9.6739	17.5140	1.34	15.88	0.999	-37.62
28 JAN 1995	9745.50	22 51	10.0	-9-12-58.3	10.4828	9.6725	15.6541	1.35	15.81	0.999	-33.08
2 FEB 1995	9750.50	22 53	14.8	-9 0 -5.2	10.5252	9.6711	13.8922	1.36	15.75	0.999	-28.56
7 FEB 1995	9755.50	22 55	22.9	-8-48-52.0	10.5818	9.6697	11.8553	1.37	15.69	1.000	-24.08
12 FEB 1995	9760.50	22 57	34.0	-8-33-21.9	10.5924	9.6683	9.5872	1.37	15.65	1.000	-19.61
17 FEB 1995	9765.50	22 59	47.4	-8-19-38.6	10.6170	9.6669	7.4420	1.38	15.61	1.000	-15.18
22 FEB 1995	9770.50	23 2	2.5	-8 -5-45.1	10.6354	9.6655	5.2802	1.38	15.58	1.000	-10.79
27 FEB 1995	9775.50	23 4	19.0	-7-51-44.2	10.6474	9.6641	3.0795	1.38	15.57	1.000	-6.47
4 MAR 1995	9780.50	23 6	36.2	-7-37-40.1	10.6531	9.6627	0.8599	1.38	15.56	1.000	-2.53
9 MAR 1995	9785.50	23 8	53.6	-7-23-36.0	10.6524	9.6613	-1.3509	1.38	15.56	1.000	3.12
14 MAR 1995	9790.50	23 11	10.8	-7 -9-35.4	10.6454	9.6599	-3.5359	1.38	15.57	1.000	7.18
19 MAR 1995	9795.50	23 13	26.7	-6-55-41.9	10.6320	9.6585	-5.6884	1.38	15.59	1.000	11.46
24 MAR 1995	9800.50	23 15	41.6	-6-41-58.0	10.6125	9.6571	-7.8129	1.37	15.62	1.000	15.78
29 MAR 1995	9805.50	23 17	54.8	-6-28-27.5	10.5889	9.6557	-9.9048	1.37	15.65	1.000	20.12
3 APR 1995	9810.50	23 20	5.3	-6-15-13.8	10.5654	9.6543	-11.9379	1.36	15.70	1.000	24.46
8 APR 1995	9815.50	23 22	13.1	-6 -2-20.2	10.5181	9.6528	-13.8899	1.35	15.76	0.999	28.80
13 APR 1995	9820.50	23 24	17.6	-5-49-50.2	10.4752	9.6514	-15.7516	1.34	15.82	0.999	33.15
18 APR 1995	9825.50	23 26	18.3	-5-37-46.8	10.4272	9.6500	-17.5242	1.33	15.89	0.999	37.49
23 APR 1995	9830.50	23 28	14.8	-5-26-12.5	10.3741	9.6486	-19.2121	1.32	15.98	0.999	41.85
28 APR 1995	9835.50	23 30	6.6	-5-15-11.1	10.3163	9.6472	-20.8017	1.31	16.06	0.999	46.22
3 MAY 1995	9840.50	23 31	53.3	-5 -4-46.4	10.2541	9.6458	-22.2667	1.30	16.16	0.998	50.60
8 MAY 1995	9845.50	23 33	34.2	-4-54-58.8	10.1879	9.6443	-23.5922	1.28	16.27	0.998	54.99
13 MAY 1995	9850.50	23 35	9.1	-4-45-54.1	10.1180	9.6429	-24.7773	1.27	16.38	0.998	59.39
18 MAY 1995	9855.50	23 36	37.6	-4-37-33.2	10.0449	9.6415	-25.8283	1.25	16.50	0.998	63.82
23 MAY 1995	9860.50	23 37	59.2	-4-29-59.2	9.9689	9.6401	-26.7441	1.23	16.62	0.998	68.27
28 MAY 1995	9865.50	23 39	13.6	-4-23-14.6	9.8906	9.6387	-27.5043	1.22	16.76	0.997	72.74
2 JUN 1995	9870.50	23 40	20.3	-4-17-21.8	9.8163	9.6372	-28.0876	1.20	16.89	0.997	77.24
7 JUN 1995	9875.50	23 41	18.9	-4-12-23.1	9.7285	9.6358	-28.4881	1.18	17.04	0.997	81.77
12 JUN 1995	9880.50	23 42	9.3	-4 -8-19.8	9.6459	9.6344	-28.7135	1.16	17.18	0.997	86.33
17 JUN 1995	9885.50	23 42	51.1	-4 -5-13.3	9.5629	9.6330	-28.7709	1.14	17.33	0.997	90.92
22 JUN 1995	9890.50	23 43	24.1	-4 -3 -5.1	9.4799	9.6315	-28.6515	1.12	17.48	0.997	95.55
27 JUN 1995	9895.50	23 43	48.1	-4 -1-56.2	9.3976	9.6301	-28.3361	1.10	17.64	0.997	100.22
2 JUL 1995	9900.50	23 44	2.9	-4 -1-47.2	9.3164	9.6287	-27.8133	1.08	17.79	0.997	104.92
7 JUL 1995	9905.50	23 44	8.4	-4 -2-38.2	9.2371	9.6272	-27.0893	1.07	17.94	0.998	109.67
12 JUL 1995	9910.50	23 44	4.7	-4 -4-27.8	9.1602	9.6258	-26.1808	1.05	18.09	0.998	114.46
17 JUL 1995	9915.50	23 43	51.9	-4 -7-15.5	9.0861	9.6244	-25.0931	1.03	18.24	0.998	119.29

GEOCENTRIC EPHEMERIS FOR SATURN

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	23 43 30.0	-4-10-59.7	9.0154	9.6229	-23.8162	1.01	18.38	0.998	124.16	
27 JUL 1995	9925.50	23 42 59.3	-4-15-38.5	8.9487	9.6215	-22.3422	1.00	18.52	0.998	129.08	
1 AUG 1995	9930.50	23 42 20.0	-4-21-9.0	8.8866	9.6201	-20.6759	0.98	18.65	0.999	134.04	
6 AUG 1995	9935.50	23 41 32.7	-4-27-27.4	8.8295	9.6186	-18.8406	0.97	18.77	0.999	139.04	
11 AUG 1995	9940.50	23 40 37.9	-4-34-29.0	8.7779	9.6172	-16.8612	0.95	18.88	0.999	144.08	
16 AUG 1995	9945.50	23 39 36.3	-4-42-9.5	8.7322	9.6158	-14.7428	0.94	18.98	0.999	149.15	
21 AUG 1995	9950.50	23 38 28.5	-4-50-23.6	8.6929	9.6143	-12.4853	0.93	19.07	0.999	154.25	
26 AUG 1995	9955.50	23 37 15.3	-4-59-5.4	8.6602	9.6129	-10.1000	0.92	19.14	1.000	159.38	
31 AUG 1995	9960.50	23 35 57.6	-5-8-8.5	8.6347	9.6114	-7.6120	0.92	19.19	1.000	164.51	
5 SEP 1995	9965.50	23 34 36.6	-5-17-25.2	8.6163	9.6100	-5.0602	0.91	19.23	1.000	169.63	
10 SEP 1995	9970.50	23 33 13.2	-5-26-48.7	8.6055	9.6086	-2.4708	0.91	19.26	1.000	174.59	
15 SEP 1995	9975.50	23 31 48.5	-5-36-11.7	8.6021	9.6071	0.1493	0.91	19.27	1.000	177.62	
20 SEP 1995	9980.50	23 30 23.6	-5-45-27.2	8.6063	9.6057	2.7868	0.91	19.28	1.000	-173.89	
25 SEP 1995	9985.50	23 28 59.7	-5-54-27.9	8.6182	9.6042	5.4145	0.91	19.23	1.000	-168.84	
30 SEP 1995	9990.50	23 27 37.8	-6-3-6.2	8.6376	9.6028	7.9957	0.91	19.19	1.000	-163.65	
5 OCT 1995	9995.50	23 26 19.3	-6-11-15.0	8.6643	9.6014	10.4923	0.92	19.13	1.000	-158.42	
10 OCT 1995	10000.50	23 25 5.0	-6-18-48.4	8.6981	9.5999	12.8901	0.93	19.05	0.999	-153.19	
15 OCT 1995	10005.50	23 23 56.0	-6-25-40.7	8.7386	9.5985	15.1848	0.94	18.97	0.999	-147.95	
20 OCT 1995	10010.50	23 22 53.1	-6-31-46.9	8.7857	9.5970	17.3586	0.95	18.86	0.999	-142.73	
25 OCT 1995	10015.50	23 21 57.2	-6-37-2.3	8.8387	9.5956	19.3838	0.96	18.75	0.999	-137.51	
30 OCT 1995	10020.50	23 21 9.1	-6-41-22.2	8.8974	9.5941	21.2295	0.98	18.63	0.999	-132.32	
4 NOV 1995	10025.50	23 20 29.4	-6-44-44.1	8.9612	9.5927	22.8789	0.99	18.49	0.998	-127.15	
9 NOV 1995	10030.50	23 19 58.7	-6-47-5.5	9.0294	9.5912	24.3370	1.01	18.35	0.998	-122.01	
14 NOV 1995	10035.50	23 19 37.2	-6-48-24.8	9.1015	9.5898	25.6058	1.02	18.21	0.998	-116.90	
19 NOV 1995	10040.50	23 19 25.2	-6-48-41.2	9.1771	9.5883	26.6731	1.04	18.06	0.998	-111.82	
24 NOV 1995	10045.50	23 19 23.1	-6-47-53.5	9.2554	9.5869	27.5198	1.06	17.91	0.998	-106.77	
29 NOV 1995	10050.50	23 19 30.9	-6-46-1.7	9.3358	9.5854	28.1342	1.08	17.75	0.997	-101.76	
4 DEC 1995	10055.50	23 19 48.6	-6-43-6.9	9.4177	9.5840	28.5248	1.10	17.60	0.997	-96.78	
9 DEC 1995	10060.50	23 20 16.0	-6-39-10.3	9.5003	9.5825	28.7092	1.12	17.44	0.997	-91.84	
14 DEC 1995	10065.50	23 20 53.0	-6-34-13.5	9.5833	9.5811	28.6939	1.13	17.29	0.997	-86.94	
19 DEC 1995	10070.50	23 21 39.4	-6-28-18.3	9.6659	9.5796	28.4719	1.15	17.15	0.997	-82.07	
24 DEC 1995	10075.50	23 22 35.0	-6-21-26.2	9.7475	9.5782	28.0351	1.17	17.00	0.997	-77.23	
29 DEC 1995	10080.50	23 23 39.3	-6-13-40.4	9.8276	9.5767	27.3926	1.19	16.86	0.998	-72.44	

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1986	6435.50	17 15 17.7	-23	-6-13.6	20.0089	19.1193	-12.1346	6.06	3.50	1.000	24.61
10 JAN 1986	6440.50	17 16 30.6	-23	-7-33.5	19.9706	19.1202	-14.3498	6.06	3.51	1.000	29.43
15 JAN 1986	6445.50	17 17 41.1	-23	-8-49.2	19.9261	19.1211	-16.4604	6.05	3.52	1.000	34.26
20 JAN 1986	6450.50	17 18 48.6	-23	-9-59.8	19.8757	19.1220	-18.4420	6.05	3.52	1.000	39.09
25 JAN 1986	6455.50	17 19 52.9	-23	-11-5.7	19.8197	19.1229	-20.2892	6.04	3.53	1.000	43.92
30 JAN 1986	6460.50	17 20 53.7	-23	-12-6.9	19.7586	19.1238	-22.0012	6.04	3.54	1.000	48.77
4 FEB 1986	6465.50	17 21 50.5	-23	-13-2.8	19.6928	19.1247	-23.5716	6.03	3.56	1.000	53.63
9 FEB 1986	6470.50	17 22 43.1	-23	-13-54.0	19.6226	19.1256	-24.9779	6.02	3.57	1.000	58.49
14 FEB 1986	6475.50	17 23 31.1	-23	-14-40.1	19.5487	19.1265	-26.1926	6.01	3.58	0.999	63.37
19 FEB 1986	6480.50	17 24 14.2	-23	-15-21.0	19.4715	19.1274	-27.2066	6.01	3.60	0.999	68.25
24 FEB 1986	6485.50	17 24 52.4	-23	-15-57.4	19.3918	19.1283	-28.0254	6.00	3.61	0.999	73.14
1 MAR 1986	6490.50	17 25 25.2	-23	-16-28.7	19.3099	19.1292	-28.6532	5.99	3.63	0.999	78.04
6 MAR 1986	6495.50	17 25 52.7	-23	-16-55.1	19.2265	19.1301	-29.0815	5.98	3.64	0.999	82.95
11 MAR 1986	6500.50	17 26 14.6	-23	-17-17.0	19.1421	19.1310	-29.2899	5.97	3.66	0.999	87.86
16 MAR 1986	6505.50	17 26 30.7	-23	-17-33.9	19.0575	19.1319	-29.2671	5.96	3.68	0.999	92.79
21 MAR 1986	6510.50	17 26 41.2	-23	-17-46.3	18.9733	19.1328	-29.0206	5.95	3.69	0.999	97.72
26 MAR 1986	6515.50	17 26 45.8	-23	-17-54.3	18.8901	19.1337	-28.5688	5.94	3.71	0.999	102.66
31 MAR 1986	6520.50	17 26 44.8	-23	-17-57.4	18.8085	19.1346	-27.9128	5.93	3.72	0.999	107.61
5 APR 1986	6525.50	17 26 38.2	-23	-17-56.3	18.7291	19.1355	-27.0497	5.92	3.74	0.999	112.57
10 APR 1986	6530.50	17 26 25.9	-23	-17-50.6	18.6525	19.1364	-25.9694	5.91	3.76	0.999	117.53
15 APR 1986	6535.50	17 26 8.4	-23	-17-40.3	18.5793	19.1373	-24.6803	5.90	3.77	1.000	122.51
20 APR 1986	6540.50	17 25 45.6	-23	-17-26.0	18.5101	19.1382	-23.2043	5.90	3.78	1.000	127.48
25 APR 1986	6545.50	17 25 18.0	-23	-17-7.2	18.4455	19.1391	-21.5855	5.89	3.80	1.000	132.46
30 APR 1986	6550.50	17 24 46.0	-23	-16-44.1	18.3857	19.1400	-19.7707	5.88	3.81	1.000	137.45
5 MAY 1986	6555.50	17 24 9.6	-23	-16-17.3	18.3314	19.1409	-17.8155	5.88	3.82	1.000	142.44
10 MAY 1986	6560.50	17 23 29.4	-23	-15-46.1	18.2830	19.1418	-15.7100	5.87	3.83	1.000	147.43
15 MAY 1986	6565.50	17 22 45.8	-23	-15-11.4	18.2408	19.1427	-13.4785	5.87	3.84	1.000	152.43
20 MAY 1986	6570.50	17 21 59.2	-23	-14-33.3	18.2052	19.1436	-11.1524	5.86	3.85	1.000	157.42
25 MAY 1986	6575.50	17 21 10.3	-23	-13-51.7	18.1765	19.1445	-8.7560	5.86	3.85	1.000	162.42
30 MAY 1986	6580.50	17 20 19.4	-23	-13-7.6	18.1547	19.1454	-6.2927	5.86	3.86	1.000	167.41
4 JUN 1986	6585.50	17 19 27.1	-23	-12-20.7	18.1402	19.1463	-3.7678	5.85	3.86	1.000	172.40
9 JUN 1986	6590.50	17 18 33.9	-23	-11-31.7	18.1330	19.1472	-1.2062	5.85	3.86	1.000	177.39
14 JUN 1986	6595.50	17 17 40.5	-23	-10-41.5	18.1332	19.1481	1.3605	5.85	3.86	1.000	-177.62
19 JUN 1986	6600.50	17 16 47.4	-23	-9-50.1	18.1408	19.1490	3.9009	5.85	3.86	1.000	-172.64
24 JUN 1986	6605.50	17 15 55.1	-23	-8-58.3	18.1557	19.1499	6.3999	5.86	3.88	1.000	-167.67
29 JUN 1986	6610.50	17 15 4.1	-23	-8-7.0	18.1778	19.1508	8.8579	5.86	3.85	1.000	-162.71
4 JUL 1986	6615.50	17 14 15.0	-23	-7-16.3	18.2068	19.1517	11.2602	5.86	3.85	1.000	-157.75
9 JUL 1986	6620.50	17 13 28.3	-23	-6-27.3	18.2427	19.1526	13.5771	5.87	3.84	1.000	-152.80
14 JUL 1986	6625.50	17 12 44.5	-23	-5-40.6	18.2851	19.1535	15.7797	5.87	3.83	1.000	-147.87
19 JUL 1986	6630.50	17 12 4.0	-23	-4-56.6	18.3337	19.1544	17.8482	5.88	3.82	1.000	-142.94

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6835.50	17 11 27.2	-23	-4-16.5	18.3881	19.1553	19.7819	5.88	3.81	1.000	-138.03
29 JUL 1986	6840.50	17 10 54.5	-23	-3-40.3	18.4478	19.1562	21.5823	5.89	3.80	1.000	-133.13
3 AUG 1986	6845.50	17 10 26.2	-23	-3 -8.7	18.5126	19.1571	23.2311	5.90	3.78	1.000	-128.23
8 AUG 1986	6850.50	17 10 2.6	-23	-2-42.6	18.5818	19.1580	24.7030	5.91	3.77	1.000	-123.35
13 AUG 1986	6855.50	17 9 44.0	-23	-2-21.9	18.6551	19.1589	25.9802	5.92	3.75	0.999	-118.48
18 AUG 1986	6860.50	17 9 30.6	-23	-2 -7.4	18.7317	19.1598	27.0611	5.92	3.74	0.999	-113.63
23 AUG 1986	6865.50	17 9 22.5	-23	-1-59.3	18.8112	19.1607	27.9563	5.93	3.72	0.999	-108.79
28 AUG 1986	6870.50	17 9 19.8	-23	-1-57.3	18.8930	19.1616	28.6660	5.94	3.71	0.999	-103.95
2 SEP 1986	6875.50	17 9 22.8	-23	-2 -2.3	18.9765	19.1625	29.1739	5.95	3.69	0.999	-99.13
7 SEP 1986	6880.50	17 9 31.2	-23	-2-13.9	19.0613	19.1633	29.4640	5.96	3.67	0.999	-94.31
12 SEP 1986	6885.50	17 9 45.3	-23	-2-31.9	19.1465	19.1642	29.5348	5.97	3.66	0.999	-89.51
17 SEP 1986	6890.50	17 10 4.9	-23	-2-50.8	19.2316	19.1651	29.4014	5.98	3.64	0.999	-84.72
22 SEP 1986	6895.50	17 10 29.8	-23	-3-27.6	19.3161	19.1660	29.0779	5.99	3.63	0.999	-79.93
27 SEP 1986	6900.50	17 11 0.2	-23	-4 -4.4	19.3994	19.1669	28.5627	6.00	3.61	0.999	-75.15
2 OCT 1986	6905.50	17 11 35.7	-23	-4-47.1	19.4809	19.1678	27.8452	6.01	3.60	0.999	-70.38
7 OCT 1986	6910.50	17 12 16.2	-23	-5-34.7	19.5600	19.1687	26.9215	6.02	3.58	0.999	-65.60
12 OCT 1986	6915.50	17 13 1.6	-23	-6-27.3	19.6362	19.1696	25.8074	6.03	3.57	0.999	-60.84
17 OCT 1986	6920.50	17 13 51.5	-23	-7-24.3	19.7089	19.1705	24.5272	6.04	3.55	1.000	-56.08
22 OCT 1986	6925.50	17 14 45.7	-23	-8-24.6	19.7777	19.1714	23.0920	6.04	3.54	1.000	-51.32
27 OCT 1986	6930.50	17 15 44.0	-23	-9-28.3	19.8421	19.1723	21.5014	6.05	3.53	1.000	-46.56
1 NOV 1986	6935.50	17 16 45.9	-23	-10-34.7	19.9017	19.1732	19.7520	6.06	3.52	1.000	-41.81
6 NOV 1986	6940.50	17 17 51.4	-23	-11-42.8	19.9561	19.1741	17.8541	6.06	3.51	1.000	-37.05
11 NOV 1986	6945.50	17 18 59.9	-23	-12-52.8	20.0047	19.1750	15.8375	6.07	3.50	1.000	-32.29
16 NOV 1986	6950.50	17 20 11.1	-23	-14 -3.0	20.0474	19.1759	13.7259	6.07	3.49	1.000	-27.53
21 NOV 1986	6955.50	17 21 24.6	-23	-15-13.7	20.0839	19.1768	11.5269	6.08	3.48	1.000	-22.77
26 NOV 1986	6960.50	17 22 40.1	-23	-16-24.3	20.1139	19.1777	9.2430	6.08	3.48	1.000	-18.01
1 DEC 1986	6965.50	17 23 57.2	-23	-17-33.9	20.1372	19.1786	6.8795	6.08	3.48	1.000	-13.24
6 DEC 1986	6970.50	17 25 15.5	-23	-18-42.4	20.1636	19.1795	4.4610	6.09	3.48	1.000	-8.47
11 DEC 1986	6975.50	17 26 34.5	-23	-19-49.2	20.1830	19.1804	2.0222	6.09	3.47	1.000	-3.69
16 DEC 1986	6980.50	17 27 53.9	-23	-20-53.8	20.1853	19.1813	-0.4199	6.09	3.47	1.000	1.09
21 DEC 1986	6985.50	17 29 13.2	-23	-21-56.2	20.1605	19.1822	-2.8604	6.09	3.47	1.000	5.87
26 DEC 1986	6990.50	17 30 32.0	-23	-22-55.8	20.1488	19.1831	-5.2936	6.09	3.48	1.000	10.66
31 DEC 1986	6995.50	17 31 49.9	-23	-23-52.4	20.1300	19.1840	-7.7047	6.08	3.48	1.000	15.46

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	17 33	6.5	-23-24-46.2	20.1043	19.1849	-10.0604	6.08	3.48	1.000	20.27
10 JAN 1987	6805.50	17 34	21.4	-23-25-38.4	20.0720	19.1868	-12.3319	6.08	3.49	1.000	25.08
15 JAN 1987	6810.50	17 35	34.1	-23-26-23.4	20.0332	19.1867	-14.5119	6.07	3.50	1.000	29.89
20 JAN 1987	6815.50	17 36	44.3	-23-27 -7.3	19.9883	19.1876	-16.5979	6.07	3.50	1.000	34.71
25 JAN 1987	6820.50	17 37	51.6	-23-27-47.5	19.9374	19.1885	-18.5815	6.06	3.51	1.000	39.54
30 JAN 1987	6825.50	17 38	55.7	-23-28-24.6	19.8811	19.1894	-20.4407	6.06	3.52	1.000	44.38
4 FEB 1987	6830.50	17 39	56.0	-23-28-58.5	19.8195	19.1903	-22.1439	6.05	3.53	1.000	49.23
9 FEB 1987	6835.50	17 40	52.4	-23-29-29.0	19.7533	19.1912	-23.6767	6.04	3.55	1.000	54.08
14 FEB 1987	6840.50	17 41	44.6	-23-29-56.8	19.6829	19.1921	-25.0417	6.04	3.56	1.000	58.93
19 FEB 1987	6845.50	17 42	32.1	-23-30-21.6	19.6089	19.1930	-26.2394	6.03	3.57	0.999	63.80
24 FEB 1987	6850.50	17 43	14.9	-23-30-43.5	19.5316	19.1939	-27.2593	6.02	3.59	0.999	68.67
1 MAR 1987	6855.50	17 43	52.5	-23-31 -3.2	19.4516	19.1948	-28.0783	6.01	3.60	0.999	73.56
6 MAR 1987	6860.50	17 44	24.9	-23-31-20.1	19.3696	19.1957	-28.6783	6.00	3.62	0.999	78.45
11 MAR 1987	6865.50	17 44	51.8	-23-31-34.8	19.2862	19.1966	-29.0616	5.99	3.63	0.999	83.35
16 MAR 1987	6870.50	17 45	13.2	-23-31-47.5	19.2020	19.1975	-29.2397	5.98	3.65	0.999	88.25
21 MAR 1987	6875.50	17 45	28.9	-23-31-57.7	19.1175	19.1984	-29.2164	5.97	3.66	0.999	93.17
26 MAR 1987	6880.50	17 45	38.9	-23-32 -6.2	19.0334	19.1993	-28.9802	5.96	3.68	0.999	98.09
31 MAR 1987	6885.50	17 45	43.1	-23-32-12.6	18.9504	19.2002	-28.5165	5.95	3.70	0.999	103.02
5 APR 1987	6890.50	17 45	41.6	-23-32-16.9	18.8690	19.2011	-27.8276	5.95	3.71	0.999	107.96
10 APR 1987	6895.50	17 45	34.5	-23-32-19.5	18.7898	19.2020	-26.9289	5.94	3.73	0.999	112.90
15 APR 1987	6900.50	17 45	21.9	-23-32-19.9	18.7136	19.2029	-25.8411	5.93	3.74	0.999	117.85
20 APR 1987	6905.50	17 45	4.0	-23-32-18.3	18.6408	19.2038	-24.5685	5.92	3.76	1.000	122.81
25 APR 1987	6910.50	17 44	41.0	-23-32-14.9	18.5719	19.2047	-23.1026	5.91	3.77	1.000	127.78
30 APR 1987	6915.50	17 44	13.1	-23-32 -9.0	18.5075	19.2056	-21.4462	5.90	3.78	1.000	132.75
5 MAY 1987	6920.50	17 43	40.7	-23-32 -1.1	18.4482	19.2065	-19.6197	5.90	3.80	1.000	137.73
10 MAY 1987	6925.50	17 43	4.0	-23-31-51.0	18.3944	19.2074	-17.6501	5.89	3.81	1.000	142.71
15 MAY 1987	6930.50	17 42	23.6	-23-31-38.4	18.3464	19.2083	-15.5599	5.89	3.82	1.000	147.69
20 MAY 1987	6935.50	17 41	39.9	-23-31-23.9	18.3046	19.2092	-13.3526	5.88	3.83	1.000	152.67
25 MAY 1987	6940.50	17 40	53.2	-23-31 -6.9	18.2694	19.2101	-11.0286	5.88	3.83	1.000	157.66
30 MAY 1987	6945.50	17 40	4.1	-23-30-47.7	18.2410	19.2110	-8.6092	5.87	3.84	1.000	162.65
4 JUN 1987	6950.50	17 39	13.0	-23-30-26.6	18.2197	19.2119	-6.1257	5.87	3.84	1.000	167.64
9 JUN 1987	6955.50	17 38	20.6	-23-30-38.4	18.2057	19.2128	-3.6080	5.87	3.85	1.000	172.62
14 JUN 1987	6960.50	17 37	27.5	-23-29-38.4	18.1989	19.2137	-1.0745	5.87	3.85	1.000	177.60
19 JUN 1987	6965.50	17 36	34.0	-23-29-12.2	18.1995	19.2146	1.4739	5.87	3.85	1.000	-177.42
24 JUN 1987	6970.50	17 35	40.8	-23-28-44.5	18.2074	19.2155	4.0253	5.87	3.85	1.000	-172.44
29 JUN 1987	6975.50	17 34	48.5	-23-28-16.1	18.2227	19.2164	6.5479	5.87	3.84	1.000	-167.47
4 JUL 1987	6980.50	17 33	57.5	-23-27-47.4	18.2452	19.2173	9.0103	5.87	3.84	1.000	-162.51
9 JUL 1987	6985.50	17 33	8.4	-23-27-18.3	18.2746	19.2182	11.3895	5.88	3.83	1.000	-157.56
14 JUL 1987	6990.50	17 32	21.8	-23-26-50.1	18.3109	19.2191	13.6785	5.88	3.83	1.000	-152.61
19 JUL 1987	6995.50	17 31	38.0	-23-26-22.5	18.3536	19.2200	15.8776	5.89	3.82	1.000	-147.68

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1987	7000.50	17 30	57.5	-23-25-56.2	18.4925	19.2209	17.9670	5.89	3.61	1.000	-142.75
29 JUL 1987	7005.50	17 30	20.8	-23-25-32.0	18.4572	19.2218	19.9162	5.90	3.79	1.000	-137.83
3 AUG 1987	7010.50	17 29	48.2	-23-25-9.8	18.5173	19.2227	21.7035	5.91	3.78	1.000	-132.92
8 AUG 1987	7015.50	17 29	20.1	-23-24-50.3	18.5824	19.2236	23.3208	5.91	3.77	1.000	-128.03
13 AUG 1987	7020.50	17 28	56.6	-23-24-34.2	18.6519	19.2245	24.7735	5.92	3.76	1.000	-123.14
18 AUG 1987	7025.50	17 28	38.2	-23-24-21.0	18.7253	19.2254	26.0604	5.93	3.74	0.999	-118.27
23 AUG 1987	7030.50	17 28	24.9	-23-24-11.7	18.8022	19.2263	27.1611	5.94	3.73	0.999	-113.41
28 AUG 1987	7035.50	17 28	17.0	-23-24-6.4	18.8820	19.2272	28.0546	5.95	3.71	0.999	-108.55
2 SEP 1987	7040.50	17 28	14.7	-23-24-4.8	18.9640	19.2281	28.7343	5.96	3.69	0.999	-103.71
7 SEP 1987	7045.50	17 28	17.9	-23-24-7.8	19.0477	19.2290	29.2092	5.97	3.68	0.999	-98.88
12 SEP 1987	7050.50	17 28	26.6	-23-24-14.7	19.1325	19.2299	29.4910	5.98	3.66	0.999	-94.06
17 SEP 1987	7055.50	17 28	40.9	-23-24-25.6	19.2179	19.2308	29.5760	5.99	3.64	0.999	-89.24
22 SEP 1987	7060.50	17 29	0.8	-23-24-40.8	19.3031	19.2317	29.4493	6.00	3.63	0.999	-84.43
27 SEP 1987	7065.50	17 29	26.1	-23-24-59.6	19.3877	19.2326	29.1028	6.01	3.61	0.999	-79.63
2 OCT 1987	7070.50	17 29	56.9	-23-25-22.1	19.4710	19.2334	28.5468	6.02	3.60	0.999	-74.84
7 OCT 1987	7075.50	17 30	32.7	-23-25-48.1	19.5524	19.2343	27.8023	6.03	3.58	0.999	-70.06
12 OCT 1987	7080.50	17 31	13.6	-23-26-16.7	19.6314	19.2352	26.8799	6.04	3.57	0.999	-65.27
17 OCT 1987	7085.50	17 31	59.3	-23-26-48.2	19.7075	19.2361	25.7757	6.05	3.55	0.999	-60.50
22 OCT 1987	7090.50	17 32	49.6	-23-27-21.9	19.7801	19.2370	24.4839	6.05	3.54	1.000	-55.72
27 OCT 1987	7095.50	17 33	44.2	-23-27-57.1	19.8487	19.2379	23.0104	6.06	3.53	1.000	-50.95
1 NOV 1987	7100.50	17 34	42.8	-23-28-34.1	19.9128	19.2388	21.3805	6.07	3.52	1.000	-46.18
6 NOV 1987	7105.50	17 35	45.1	-23-29-11.7	19.9721	19.2397	19.6184	6.07	3.51	1.000	-41.41
11 NOV 1987	7110.50	17 36	50.8	-23-29-49.9	20.0260	19.2406	17.7303	6.08	3.50	1.000	-36.64
16 NOV 1987	7115.50	17 37	59.6	-23-30-28.2	20.0744	19.2415	15.7161	6.08	3.49	1.000	-31.88
21 NOV 1987	7120.50	17 39	11.0	-23-31-8.0	20.1167	19.2424	13.5800	6.09	3.48	1.000	-27.10
26 NOV 1987	7125.50	17 40	24.8	-23-31-43.1	20.1527	19.2433	11.3419	6.09	3.48	1.000	-22.33
1 DEC 1987	7130.50	17 41	40.5	-23-32-19.2	20.1821	19.2442	9.0357	6.10	3.47	1.000	-17.56
6 DEC 1987	7135.50	17 42	57.7	-23-32-53.5	20.2048	19.2451	6.0806	6.10	3.47	1.000	-12.78
11 DEC 1987	7140.50	17 44	16.0	-23-33-26.3	20.2207	19.2460	4.2795	6.10	3.46	1.000	-8.01
16 DEC 1987	7145.50	17 45	36.0	-23-33-57.2	20.2295	19.2469	1.8382	6.10	3.46	1.000	-3.23
21 DEC 1987	7150.50	17 46	54.4	-23-34-25.6	20.2312	19.2478	-0.6297	6.10	3.46	1.000	1.57
26 DEC 1987	7155.50	17 48	13.6	-23-34-52.1	20.2259	19.2487	-3.0934	6.10	3.46	1.000	6.36
31 DEC 1987	7160.50	17 49	32.3	-23-35-15.9	20.2134	19.2496	-5.5209	6.10	3.47	1.000	11.15

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	7165.50	17 50	50.0	-23-35-37.3	20.1940	19.2505	-7.9027	6.10	3.47	1.000	15.95
10 JAN 1988	7170.50	17 52	6.3	-23-35-58.5	20.1878	19.2514	-10.2366	6.10	3.47	1.000	20.75
15 JAN 1988	7175.50	17 53	20.9	-23-36-13.0	20.1350	19.2523	-12.5123	6.09	3.48	1.000	25.58
20 JAN 1988	7180.50	17 54	33.3	-23-36-27.4	20.0958	19.2532	-14.7085	6.09	3.49	1.000	30.38
25 JAN 1988	7185.50	17 55	43.1	-23-36-39.8	20.0501	19.2541	-16.7921	6.08	3.49	1.000	35.20
30 JAN 1988	7190.50	17 56	49.9	-23-36-49.9	19.9988	19.2550	-18.7430	6.08	3.50	1.000	40.03
4 FEB 1988	7195.50	17 57	53.5	-23-36-58.5	19.9420	19.2559	-20.5618	6.07	3.51	1.000	44.86
9 FEB 1988	7200.50	17 58	53.3	-23-37-5.6	19.8802	19.2568	-22.2467	6.07	3.52	1.000	49.70
14 FEB 1988	7205.50	17 59	49.2	-23-37-11.2	19.8137	19.2577	-23.7848	6.06	3.54	1.000	54.54
19 FEB 1988	7210.50	18 0	40.8	-23-37-16.1	19.7430	19.2586	-25.1517	6.05	3.55	1.000	59.40
24 FEB 1988	7215.50	18 1	27.8	-23-37-20.0	19.6886	19.2595	-26.3238	6.04	3.56	0.999	64.26
29 FEB 1988	7220.50	18 2	9.9	-23-37-23.5	19.5911	19.2604	-27.2976	6.03	3.58	0.999	69.12
5 MAR 1988	7225.50	18 2	47.0	-23-37-26.9	19.5111	19.2613	-28.0817	6.02	3.59	0.999	74.00
10 MAR 1988	7230.50	18 3	18.8	-23-37-30.0	19.4291	19.2622	-28.6759	6.02	3.61	0.999	78.87
15 MAR 1988	7235.50	18 3	45.2	-23-37-33.5	19.3457	19.2631	-29.0665	6.01	3.62	0.999	83.76
20 MAR 1988	7240.50	18 4	6.0	-23-37-37.3	19.2614	19.2640	-29.2341	6.00	3.64	0.999	88.68
25 MAR 1988	7245.50	18 4	21.1	-23-37-41.3	19.1771	19.2649	-29.1731	5.99	3.65	0.999	93.56
30 MAR 1988	7250.50	18 4	30.6	-23-37-46.2	19.0932	19.2658	-28.8980	5.98	3.67	0.999	98.47
4 APR 1988	7255.50	18 4	34.3	-23-37-51.5	19.0104	19.2667	-28.4171	5.97	3.68	0.999	103.39
9 APR 1988	7260.50	18 4	32.4	-23-37-57.3	18.9292	19.2676	-27.7383	5.96	3.70	0.999	108.32
14 APR 1988	7265.50	18 4	25.0	-23-38-4.0	18.8504	19.2685	-26.8477	5.95	3.72	0.999	113.25
19 APR 1988	7270.50	18 4	12.0	-23-38-10.8	18.7744	19.2694	-25.7405	5.94	3.73	0.999	118.19
24 APR 1988	7275.50	18 3	53.7	-23-38-18.0	18.7019	19.2703	-24.4315	5.93	3.75	1.000	123.14
29 APR 1988	7280.50	18 3	30.3	-23-38-25.6	18.6335	19.2712	-22.9439	5.92	3.76	1.000	128.09
4 MAY 1988	7285.50	18 3	2.2	-23-38-32.9	18.5695	19.2721	-21.2981	5.91	3.77	1.000	133.05
9 MAY 1988	7290.50	18 2	29.6	-23-38-40.2	18.5106	19.2730	-19.4905	5.91	3.78	1.000	138.01
14 MAY 1988	7295.50	18 1	52.8	-23-38-47.1	18.4571	19.2739	-17.5227	5.91	3.79	1.000	142.98
19 MAY 1988	7300.50	18 1	12.3	-23-38-53.1	18.4096	19.2748	-15.4077	5.90	3.80	1.000	147.96
24 MAY 1988	7305.50	18 0	28.3	-23-38-58.6	18.3683	19.2757	-13.1752	5.90	3.81	1.000	152.94
29 MAY 1988	7310.50	17 59	41.6	-23-39-2.9	18.3335	19.2766	-10.8525	5.89	3.82	1.000	157.91
3 JUN 1988	7315.50	17 58	52.5	-23-39-6.0	18.3056	19.2775	-8.4577	5.89	3.83	1.000	162.89
8 JUN 1988	7320.50	17 58	1.4	-23-39-8.0	18.2848	19.2784	-5.9930	5.89	3.83	1.000	167.87
13 JUN 1988	7325.50	17 57	9.0	-23-39-8.2	18.2711	19.2793	-3.4657	5.88	3.83	1.000	172.85
18 JUN 1988	7330.50	17 56	15.9	-23-39-7.3	18.2648	19.2802	-0.9087	5.88	3.83	1.000	177.82
23 JUN 1988	7335.50	17 55	22.4	-23-39-4.9	18.2659	19.2811	1.6507	5.88	3.83	1.000	-177.18
28 JUN 1988	7340.50	17 54	29.3	-23-39-0.8	18.2743	19.2820	4.1824	5.88	3.83	1.000	-172.22
3 JUL 1988	7345.50	17 53	37.1	-23-38-55.8	18.2900	19.2829	6.6771	5.89	3.83	1.000	-167.25
8 JUL 1988	7350.50	17 52	46.2	-23-38-49.6	18.3128	19.2838	9.1334	5.89	3.82	1.000	-162.29
13 JUL 1988	7355.50	17 51	57.2	-23-38-42.2	18.3427	19.2847	11.6327	5.89	3.82	1.000	-157.34
18 JUL 1988	7360.50	17 51	10.7	-23-38-34.4	18.3793	19.2856	13.8401	5.90	3.81	1.000	-152.39

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	17 50	27.0	-23-38-25.9	18.4225	19.2865	16.0299	5.90	3.80	1.000	-147.45
28 JUL 1988	7370.50	17 49	46.8	-23-38-17.2	18.4718	19.2874	18.0892	5.91	3.79	1.000	-142.52
2 AUG 1988	7375.50	17 49	10.3	-23-38-8.8	18.5268	19.2883	20.0176	5.92	3.78	1.000	-137.60
7 AUG 1988	7380.50	17 48	37.8	-23-38-0.5	18.5873	19.2892	21.8127	5.93	3.77	1.000	-132.69
12 AUG 1988	7385.50	17 48	9.9	-23-37-53.0	18.6527	19.2901	23.4512	5.93	3.76	1.000	-127.79
17 AUG 1988	7390.50	17 47	46.6	-23-37-46.4	18.7225	19.2910	24.9062	5.94	3.74	1.000	-122.89
22 AUG 1988	7395.50	17 47	28.5	-23-37-40.7	18.7863	19.2919	26.1661	5.95	3.73	0.999	-118.01
27 AUG 1988	7400.50	17 47	15.5	-23-37-36.7	18.8735	19.2928	27.2337	5.96	3.71	0.999	-113.14
1 SEP 1988	7405.50	17 47	7.9	-23-37-33.9	18.9634	19.2937	28.1172	5.97	3.70	0.999	-108.28
6 SEP 1988	7410.50	17 47	5.8	-23-37-32.6	19.0357	19.2946	28.8110	5.98	3.68	0.999	-103.43
11 SEP 1988	7415.50	17 47	9.2	-23-37-33.2	19.1196	19.2955	29.2956	5.98	3.66	0.999	-98.58
16 SEP 1988	7420.50	17 47	18.2	-23-37-35.2	19.2047	19.2964	29.5581	5.99	3.65	0.999	-93.75
21 SEP 1988	7425.50	17 47	33.0	-23-37-38.9	19.2901	19.2973	29.6031	6.00	3.63	0.999	-88.92
26 SEP 1988	7430.50	17 47	53.2	-23-37-44.3	19.3754	19.2982	29.4473	6.01	3.62	0.999	-84.10
1 OCT 1988	7435.50	17 48	18.8	-23-37-50.6	19.4600	19.2991	29.1000	6.02	3.60	0.999	-79.29
6 OCT 1988	7440.50	17 48	49.8	-23-37-58.6	19.5433	19.3000	28.5544	6.03	3.58	0.999	-74.49
11 OCT 1988	7445.50	17 49	26.0	-23-38-7.4	19.6247	19.3009	27.8005	6.04	3.57	0.999	-69.69
16 OCT 1988	7450.50	17 50	7.2	-23-38-16.8	19.7037	19.3018	26.8405	6.05	3.55	0.999	-64.89
21 OCT 1988	7455.50	17 50	53.3	-23-38-27.0	19.7796	19.3027	25.8941	6.06	3.54	1.000	-60.10
26 OCT 1988	7460.50	17 51	43.8	-23-38-37.2	19.8519	19.3036	24.3846	6.07	3.53	1.000	-55.32
31 OCT 1988	7465.50	17 52	38.7	-23-38-47.2	19.9263	19.3045	22.9175	6.07	3.52	1.000	-50.53
5 NOV 1988	7470.50	17 53	37.5	-23-38-57.1	19.9841	19.3054	21.2891	6.08	3.50	1.000	-45.75
10 NOV 1988	7475.50	17 54	40.1	-23-39-5.9	20.0431	19.3063	19.5013	6.09	3.49	1.000	-40.97
15 NOV 1988	7480.50	17 55	46.0	-23-39-13.9	20.0966	19.3071	17.5702	6.09	3.49	1.000	-36.19
20 NOV 1988	7485.50	17 56	54.9	-23-39-20.7	20.1444	19.3080	15.5266	6.10	3.48	1.000	-31.41
25 NOV 1988	7490.50	17 58	6.5	-23-39-25.7	20.1862	19.3089	13.3914	6.10	3.47	1.000	-26.63
30 NOV 1988	7495.50	17 59	20.3	-23-39-29.2	20.2217	19.3098	11.1662	6.11	3.46	1.000	-21.85
5 DEC 1988	7500.50	18 0	35.9	-23-39-30.7	20.2506	19.3107	8.8544	6.11	3.46	1.000	-17.07
10 DEC 1988	7505.50	18 1	53.1	-23-39-29.9	20.2727	19.3116	6.4691	6.11	3.46	1.000	-12.28
15 DEC 1988	7510.50	18 3	11.4	-23-39-27.3	20.2879	19.3125	4.0374	6.12	3.45	1.000	-7.50
20 DEC 1988	7515.50	18 4	30.2	-23-39-22.2	20.2961	19.3134	1.5926	6.12	3.45	1.000	-2.72
25 DEC 1988	7520.50	18 5	49.4	-23-39-14.9	20.2971	19.3143	-0.8529	6.12	3.45	1.000	2.09
30 DEC 1988	7525.50	18 7	8.3	-23-39-5.7	20.2911	19.3152	-3.2985	6.12	3.45	1.000	6.88

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (^m)	PHASE	ELONG
4 JAN 1989	7530.50	18 8 26.6	-23-38-54.1	20.2781	19.3161	-5.7336	6.11	3.45	1.000	11.68	
9 JAN 1989	7535.50	18 9 44.0	-23-38-40.8	20.2580	19.3170	-8.1368	6.11	3.46	1.000	16.48	
14 JAN 1989	7540.50	18 10 59.9	-23-38-25.8	20.2312	19.3179	-10.4769	6.11	3.46	1.000	21.28	
19 JAN 1989	7545.50	18 12 14.0	-23-38 -9.1	20.1976	19.3188	-12.7258	6.11	3.47	1.000	26.09	
24 JAN 1989	7550.50	18 13 25.8	-23-37-51.5	20.1577	19.3197	-14.8846	6.10	3.47	1.000	30.90	
29 JAN 1989	7555.50	18 14 35.0	-23-37-32.9	20.1118	19.3206	-16.9504	6.10	3.48	1.000	35.72	
3 FEB 1989	7560.50	18 15 41.3	-23-37-13.6	20.0599	19.3215	-18.9078	6.09	3.49	1.000	40.54	
8 FEB 1989	7565.50	18 16 44.2	-23-36-54.5	20.0027	19.3224	-20.7320	6.09	3.50	1.000	45.37	
13 FEB 1989	7570.50	18 17 43.4	-23-36-35.3	19.9404	19.3233	-22.3953	6.08	3.51	1.000	50.21	
18 FEB 1989	7575.50	18 18 38.6	-23-36-16.8	19.8735	19.3242	-23.8886	6.07	3.52	1.000	55.04	
23 FEB 1989	7580.50	18 19 29.4	-23-35-59.5	19.8026	19.3251	-25.2180	6.06	3.54	1.000	59.89	
28 FEB 1989	7585.50	18 20 15.7	-23-35-43.3	19.7280	19.3260	-26.3807	6.06	3.55	0.999	64.73	
5 MAR 1989	7590.50	18 20 57.2	-23-35-29.0	19.6504	19.3269	-27.3802	6.05	3.56	0.999	69.59	
10 MAR 1989	7595.50	18 21 33.6	-23-35-16.8	19.5702	19.3278	-28.1340	6.04	3.58	0.999	74.46	
15 MAR 1989	7600.50	18 22 4.7	-23-35 -6.7	19.4881	19.3287	-28.6898	6.03	3.59	0.999	79.33	
20 MAR 1989	7605.50	18 22 30.4	-23-34-59.6	19.4047	19.3296	-29.0349	6.02	3.61	0.999	84.20	
25 MAR 1989	7610.50	18 22 50.6	-23-34-55.1	19.3206	19.3305	-29.1803	6.01	3.63	0.999	89.09	
30 MAR 1989	7615.50	18 23 5.2	-23-34-53.5	19.2364	19.3314	-29.1242	6.00	3.64	0.999	93.98	
4 APR 1989	7620.50	18 23 14.1	-23-34-55.3	19.1528	19.3323	-28.8517	5.99	3.66	0.999	98.88	
9 APR 1989	7625.50	18 23 17.4	-23-34-59.9	19.0699	19.3332	-28.3515	5.98	3.67	0.999	103.78	
14 APR 1989	7630.50	18 23 15.0	-23-35 -7.7	18.9891	19.3341	-27.6317	5.97	3.69	0.999	108.70	
19 APR 1989	7635.50	18 23 7.0	-23-35-18.6	18.9106	19.3350	-26.7116	5.97	3.70	0.999	113.62	
24 APR 1989	7640.50	18 22 53.7	-23-35-32.0	18.8350	19.3359	-25.6053	5.96	3.72	0.999	118.55	
29 APR 1989	7645.50	18 22 35.2	-23-35-48.3	18.7629	19.3368	-24.3127	5.95	3.73	1.000	123.48	
4 MAY 1989	7650.50	18 22 11.6	-23-36 -7.0	18.6947	19.3377	-22.8252	5.94	3.75	1.000	128.43	
9 MAY 1989	7655.50	18 21 43.2	-23-36-27.5	18.6312	19.3386	-21.1501	5.93	3.76	1.000	133.38	
14 MAY 1989	7660.50	18 21 10.4	-23-36-50.1	18.5727	19.3395	-19.3133	5.93	3.77	1.000	138.33	
19 MAY 1989	7665.50	18 20 33.5	-23-37-13.8	18.5198	19.3404	-17.3398	5.92	3.78	1.000	143.29	
24 MAY 1989	7670.50	18 19 52.9	-23-37-38.4	18.4727	19.3413	-15.2447	5.92	3.79	1.000	148.25	
29 MAY 1989	7675.50	18 19 9.0	-23-38 -3.9	18.4319	19.3422	-13.0299	5.91	3.80	1.000	153.22	
3 JUN 1989	7680.50	18 18 22.2	-23-38-29.2	18.3976	19.3431	-10.6981	5.91	3.81	1.000	158.19	
8 JUN 1989	7685.50	18 17 33.1	-23-38-54.4	18.3702	19.3440	-8.2755	5.90	3.81	1.000	163.17	
13 JUN 1989	7690.50	18 16 42.1	-23-39-19.2	18.3498	19.3449	-5.7966	5.90	3.82	1.000	168.14	
18 JUN 1989	7695.50	18 15 49.9	-23-39-42.8	18.3367	19.3458	-3.2846	5.90	3.82	1.000	173.11	
23 JUN 1989	7700.50	18 14 56.9	-23-40 -5.4	18.3309	19.3467	-0.7526	5.90	3.82	1.000	178.07	
28 JUN 1989	7705.50	18 14 3.6	-23-40-26.6	18.3324	19.3476	1.7967	5.90	3.82	1.000	-176.92	
3 JUL 1989	7710.50	18 13 10.7	-23-40-46.0	18.3413	19.3485	4.3476	5.90	3.82	1.000	-171.96	
8 JUL 1989	7715.50	18 12 18.6	-23-41 -4.0	18.3575	19.3494	6.8636	5.90	3.82	1.000	-166.99	
13 JUL 1989	7720.50	18 11 27.9	-23-41-19.9	18.3808	19.3503	9.3147	5.91	3.81	1.000	-162.03	
18 JUL 1989	7725.50	18 10 39.2	-23-41-33.9	18.4112	19.3512	11.6857	5.91	3.80	1.000	-157.08	

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1989	7730.50	18 9 53.0	-23-41-46.3	18.4482	19.3521	13.9710	5.91	3.80	1.000	-152.13	
28 JUL 1989	7735.50	18 9 9.6	-23-41-56.5	18.4918	19.3530	16.1663	5.92	3.79	1.000	-147.19	
2 AUG 1989	7740.50	18 8 29.6	-23-42-5.2	18.5415	19.3539	18.2478	5.93	3.78	1.000	-142.26	
7 AUG 1989	7745.50	18 7 53.2	-23-42-12.3	18.5970	19.3548	20.1824	5.94	3.77	1.000	-137.33	
12 AUG 1989	7750.50	18 7 21.1	-23-42-17.6	18.6579	19.3557	21.9638	5.94	3.75	1.000	-132.41	
17 AUG 1989	7755.50	18 6 53.5	-23-42-21.8	18.7237	19.3566	23.5595	5.95	3.74	1.000	-127.50	
22 AUG 1989	7760.50	18 6 30.6	-23-42-24.6	18.7938	19.3575	25.0025	5.95	3.73	1.000	-122.61	
27 AUG 1989	7765.50	18 6 12.7	-23-42-26.1	18.8679	19.3584	26.2762	5.96	3.71	0.999	-117.72	
1 SEP 1989	7770.50	18 6 0.1	-23-42-26.9	18.9454	19.3593	27.3567	5.97	3.70	0.999	-112.83	
6 SEP 1989	7775.50	18 5 52.7	-23-42-26.5	19.0257	19.3602	28.2249	5.98	3.68	0.999	-107.96	
11 SEP 1989	7780.50	18 5 51.0	-23-42-25.2	19.1082	19.3611	28.8806	5.99	3.67	0.999	-103.10	
16 SEP 1989	7785.50	18 5 54.8	-23-42-23.2	19.1923	19.3619	29.3349	6.00	3.65	0.999	-98.25	
21 SEP 1989	7790.50	18 6 4.2	-23-42-20.1	19.2774	19.3628	29.5950	6.01	3.63	0.999	-93.40	
26 SEP 1989	7795.50	18 6 19.2	-23-42-16.3	19.3630	19.3637	29.6517	6.02	3.62	0.999	-88.56	
1 OCT 1989	7800.50	18 6 39.6	-23-42-11.5	19.4485	19.3646	29.4898	6.03	3.60	0.999	-83.73	
6 OCT 1989	7805.50	18 7 5.6	-23-42-5.5	19.5331	19.3655	29.1070	6.04	3.59	0.999	-78.90	
11 OCT 1989	7810.50	18 7 37.0	-23-41-58.6	19.6164	19.3664	28.5180	6.05	3.57	0.999	-74.09	
16 OCT 1989	7815.50	18 8 13.5	-23-41-50.2	19.6977	19.3673	27.7430	6.06	3.56	0.999	-69.28	
21 OCT 1989	7820.50	18 8 55.0	-23-41-40.2	19.7764	19.3682	26.7872	6.07	3.54	0.999	-64.47	
26 OCT 1989	7825.50	18 9 41.2	-23-41-29.0	19.8522	19.3691	25.6429	6.07	3.53	1.000	-59.67	
31 OCT 1989	7830.50	18 10 32.0	-23-41-15.6	19.9244	19.3700	24.3085	6.08	3.52	1.000	-54.87	
5 NOV 1989	7835.50	18 11 27.1	-23-41-0.3	19.9924	19.3709	22.7964	6.09	3.50	1.000	-50.07	
10 NOV 1989	7840.50	18 12 26.1	-23-40-43.0	20.0559	19.3718	21.1331	6.10	3.49	1.000	-45.28	
15 NOV 1989	7845.50	18 13 28.7	-23-40-23.1	20.1143	19.3727	19.3401	6.11	3.48	1.000	-40.49	
20 NOV 1989	7850.50	18 14 34.7	-23-40-1.1	20.1675	19.3736	17.4184	6.11	3.47	1.000	-35.70	
25 NOV 1989	7855.50	18 15 43.5	-23-39-36.4	20.2148	19.3745	15.3672	6.11	3.46	1.000	-30.91	
30 NOV 1989	7860.50	18 16 55.1	-23-39-8.9	20.2561	19.3754	13.1983	6.12	3.46	1.000	-26.12	
5 DEC 1989	7865.50	18 18 8.8	-23-38-39.0	20.2910	19.3763	10.9359	6.12	3.45	1.000	-21.33	
10 DEC 1989	7870.50	18 19 24.3	-23-38-6.2	20.3192	19.3772	8.6117	6.13	3.45	1.000	-16.54	
15 DEC 1989	7875.50	18 20 41.3	-23-37-30.8	20.3406	19.3781	6.2412	6.13	3.44	1.000	-11.75	
20 DEC 1989	7880.50	18 21 59.2	-23-36-53.1	20.3552	19.3790	3.8232	6.13	3.44	1.000	-6.97	
25 DEC 1989	7885.50	18 23 17.7	-23-36-12.7	20.3627	19.3799	1.3667	6.13	3.44	1.000	-2.18	
30 DEC 1989	7890.50	18 24 36.5	-23-35-30.2	20.3631	19.3808	-1.1066	6.13	3.44	1.000	2.64	

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	18 25	55.0	-23-34-45.9	20.3563	19.3817	-3.5663	6.13	3.44	1.000	7.43
9 JAN 1990	7900.50	18 27	12.8	-23-33-59.6	20.3425	19.3826	-5.9845	6.13	3.44	1.000	12.23
14 JAN 1990	7905.50	18 28	29.6	-23-33-12.3	20.3218	19.3835	-8.3658	6.13	3.45	1.000	17.02
19 JAN 1990	7910.50	18 29	44.9	-23-32-23.9	20.2943	19.3844	-10.6798	6.12	3.45	1.000	21.83
24 JAN 1990	7915.50	18 30	58.3	-23-31-34.9	20.2602	19.3853	-12.9397	6.12	3.46	1.000	26.63
29 JAN 1990	7920.50	18 32	9.5	-23-30-46.1	20.2197	19.3862	-15.1097	6.12	3.46	1.000	31.45
3 FEB 1990	7925.50	18 33	18.0	-23-29-57.4	20.1730	19.3871	-17.1607	6.11	3.47	1.000	36.28
8 FEB 1990	7930.50	18 34	23.5	-23-29-9.8	20.1207	19.3880	-19.0776	6.11	3.48	1.000	41.08
13 FEB 1990	7935.50	18 35	25.6	-23-28-23.8	20.0630	19.3889	-20.8844	6.10	3.49	1.000	45.90
18 FEB 1990	7940.50	18 36	24.0	-23-27-39.4	20.0003	19.3898	-22.5173	6.09	3.50	1.000	50.72
23 FEB 1990	7945.50	18 37	18.4	-23-26-57.7	19.9331	19.3906	-24.0169	6.09	3.51	1.000	55.58
28 FEB 1990	7950.50	18 38	8.5	-23-26-19.0	19.8618	19.3915	-25.3385	6.08	3.53	1.000	60.39
5 MAR 1990	7955.50	18 38	53.9	-23-25-43.6	19.7869	19.3924	-26.4644	6.07	3.54	0.999	65.24
10 MAR 1990	7960.50	18 39	34.6	-23-25-12.4	19.7091	19.3933	-27.3961	6.06	3.55	0.999	70.08
15 MAR 1990	7965.50	18 40	10.2	-23-24-45.4	19.6289	19.3942	-28.1426	6.05	3.57	0.999	74.93
20 MAR 1990	7970.50	18 40	40.6	-23-24-23.0	19.5467	19.3951	-28.6987	6.04	3.58	0.999	79.79
25 MAR 1990	7975.50	18 41	5.6	-23-24-5.9	19.4633	19.3960	-29.0463	6.03	3.60	0.999	84.66
30 MAR 1990	7980.50	18 41	25.1	-23-23-53.8	19.3792	19.3969	-29.1695	6.03	3.61	0.999	89.53
4 APR 1990	7985.50	18 41	39.1	-23-23-47.2	19.2951	19.3978	-29.0688	6.02	3.63	0.999	94.42
9 APR 1990	7990.50	18 41	47.4	-23-23-46.4	19.2115	19.3987	-28.7597	6.01	3.65	0.999	99.30
14 APR 1990	7995.50	18 41	50.1	-23-23-50.7	19.1292	19.3996	-28.2528	6.00	3.66	0.999	104.20
19 APR 1990	8000.50	18 41	47.3	-23-24-0.8	19.0485	19.4005	-27.5442	5.99	3.68	0.999	109.10
24 APR 1990	8005.50	18 41	38.9	-23-24-16.2	18.9703	19.4014	-26.6218	5.98	3.69	0.999	114.01
29 APR 1990	8010.50	18 41	25.3	-23-24-36.6	18.8950	19.4023	-25.4852	5.97	3.71	0.999	118.93
4 MAY 1990	8015.50	18 41	6.4	-23-25-2.2	18.8233	19.4032	-24.1550	5.96	3.72	1.000	123.86
9 MAY 1990	8020.50	18 40	42.5	-23-25-32.0	18.7557	19.4041	-22.6535	5.96	3.73	1.000	128.79
14 MAY 1990	8025.50	18 40	14.0	-23-26-5.7	18.6926	19.4050	-20.9920	5.95	3.75	1.000	133.73
19 MAY 1990	8030.50	18 39	41.1	-23-26-43.4	18.6346	19.4059	-19.1702	5.94	3.76	1.000	138.67
24 MAY 1990	8035.50	18 39	4.1	-23-27-23.8	18.5820	19.4068	-17.1863	5.94	3.77	1.000	143.62
29 MAY 1990	8040.50	18 38	23.5	-23-28-6.8	18.5354	19.4077	-15.0600	5.93	3.78	1.000	148.58
3 JUN 1990	8045.50	18 37	39.6	-23-28-51.9	18.4952	19.4086	-12.8243	5.93	3.79	1.000	153.54
8 JUN 1990	8050.50	18 36	53.0	-23-29-37.9	18.4615	19.4094	-10.5016	5.92	3.79	1.000	158.51
13 JUN 1990	8055.50	18 36	4.0	-23-30-24.9	18.4346	19.4103	-8.1033	5.92	3.80	1.000	163.47
18 JUN 1990	8060.50	18 35	13.2	-23-31-12.0	18.4147	19.4112	-5.6328	5.92	3.80	1.000	168.44
23 JUN 1990	8065.50	18 34	21.2	-23-31-58.5	18.4021	19.4121	-3.1017	5.91	3.81	1.000	173.41
28 JUN 1990	8070.50	18 33	28.4	-23-32-44.5	18.3968	19.4130	-0.5447	5.91	3.81	1.000	178.36
3 JUL 1990	8075.50	18 32	35.4	-23-33-28.7	18.3900	19.4139	2.0048	5.91	3.81	1.000	-176.62
8 JUL 1990	8080.50	18 31	42.8	-23-34-11.1	18.4084	19.4148	4.5303	5.92	3.80	1.000	-171.66
13 JUL 1990	8085.50	18 30	51.1	-23-34-51.5	18.4251	19.4157	7.0236	5.92	3.80	1.000	-166.70
18 JUL 1990	8090.50	18 30	0.7	-23-35-29.0	18.4489	19.4166	9.4785	5.92	3.80	1.000	-161.74

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	18 29	12.4	-23-36 -4.0	18.4798	19.4175	11.8724	5.92	3.79	1.000	-156.78
28 JUL 1990	8100.50	18 28	26.4	-23-36-36.0	18.5174	19.4184	14.1680	5.93	3.78	1.000	-151.83
2 AUG 1990	8105.50	18 27	43.4	-23-37 -4.6	18.5515	19.4193	16.3434	5.93	3.77	1.000	-146.88
7 AUG 1990	8110.50	18 27	3.8	-23-37-30.1	18.6117	19.4202	18.3928	5.94	3.76	1.000	-141.95
12 AUG 1990	8115.50	18 28	27.9	-23-37-52.2	18.6678	19.4211	20.3136	5.95	3.75	1.000	-137.02
17 AUG 1990	8120.50	18 25	56.2	-23-38-10.8	18.7289	19.4220	22.0981	5.95	3.74	1.000	-132.09
22 AUG 1990	8125.50	18 25	28.9	-23-38-28.2	18.7951	19.4229	23.7194	5.96	3.73	1.000	-127.17
27 AUG 1990	8130.50	18 25	6.4	-23-38-38.0	18.8657	19.4237	25.1516	5.97	3.71	1.000	-122.27
1 SEP 1990	8135.50	18 24	49.0	-23-38-46.4	18.9401	19.4246	26.3894	5.98	3.70	0.999	-117.37
6 SEP 1990	8140.50	18 24	36.7	-23-38-51.6	19.0179	19.4255	27.4387	5.99	3.68	0.999	-112.48
11 SEP 1990	8145.50	18 24	29.8	-23-38-53.1	19.0984	19.4264	28.3031	6.00	3.67	0.999	-107.60
16 SEP 1990	8150.50	18 24	28.4	-23-38-51.6	19.1812	19.4273	28.9716	6.01	3.65	0.999	-102.73
21 SEP 1990	8155.50	18 24	32.5	-23-38-46.7	19.2655	19.4282	29.4236	6.02	3.64	0.999	-97.86
26 SEP 1990	8160.50	18 24	42.3	-23-38-38.3	19.3509	19.4291	29.6510	6.03	3.62	0.999	-93.00
1 OCT 1990	8165.50	18 24	57.6	-23-38-28.7	19.4368	19.4300	29.6641	6.04	3.60	0.999	-88.15
6 OCT 1990	8170.50	18 25	18.4	-23-38-11.6	19.5220	19.4309	29.4785	6.05	3.59	0.999	-83.31
11 OCT 1990	8175.50	18 25	44.7	-23-37-53.0	19.6067	19.4318	29.0983	6.05	3.57	0.999	-78.48
16 OCT 1990	8180.50	18 26	16.3	-23-37-31.1	19.6899	19.4327	28.5127	6.06	3.56	0.999	-73.65
21 OCT 1990	8185.50	18 26	53.0	-23-37 -5.4	19.7711	19.4336	27.7146	6.07	3.54	0.999	-68.82
26 OCT 1990	8190.50	18 27	34.8	-23-36-36.1	19.8498	19.4345	26.7129	6.08	3.53	0.999	-64.00
31 OCT 1990	8195.50	18 28	21.2	-23-36 -3.3	19.9252	19.4353	25.5296	6.09	3.52	1.000	-59.19
5 NOV 1990	8200.50	18 29	12.1	-23-35-26.5	19.9970	19.4362	24.1847	6.10	3.50	1.000	-54.38
10 NOV 1990	8205.50	18 30	7.3	-23-34-46.1	20.0648	19.4371	22.6789	6.11	3.49	1.000	-49.57
15 NOV 1990	8210.50	18 31	6.3	-23-34 -1.8	20.1279	19.4380	21.0071	6.11	3.48	1.000	-44.77
20 NOV 1990	8215.50	18 32	8.9	-23-33-13.5	20.1859	19.4389	19.1781	6.12	3.47	1.000	-39.97
25 NOV 1990	8220.50	18 33	14.9	-23-32-21.6	20.2385	19.4398	17.2133	6.12	3.46	1.000	-35.17
30 NOV 1990	8225.50	18 34	23.6	-23-31-25.9	20.2852	19.4407	15.1418	6.13	3.45	1.000	-30.37
5 DEC 1990	8230.50	18 35	35.0	-23-30-26.4	20.3259	19.4416	12.9805	6.13	3.45	1.000	-25.58
10 DEC 1990	8235.50	18 36	48.4	-23-29-23.6	20.3601	19.4425	10.7276	6.14	3.44	1.000	-20.78
15 DEC 1990	8240.50	18 38	3.6	-23-28-17.2	20.3877	19.4434	8.3881	6.14	3.44	1.000	-15.99
20 DEC 1990	8245.50	18 39	20.3	-23-27 -7.8	20.4085	19.4443	5.9836	6.14	3.43	1.000	-11.19
25 DEC 1990	8250.50	18 40	37.8	-23-25-55.7	20.4223	19.4451	3.5428	6.14	3.43	1.000	-6.40
30 DEC 1990	8255.50	18 41	55.8	-23-24-40.8	20.4290	19.4460	1.0941	6.15	3.43	1.000	-1.63

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1991	8260.50	18 43	14.0	-23-23-24.0	20.4286	19.4469	-1.3537	6.15	3.43	1.000	3.22
9 JAN 1991	8265.50	18 44	31.9	-23-22-5.5	20.4211	19.4478	-3.8018	6.14	3.43	1.000	8.00
14 JAN 1991	8270.50	18 45	49.1	-23-20-45.6	20.4066	19.4487	-6.2343	6.14	3.43	1.000	12.80
19 JAN 1991	8275.50	18 47	5.1	-23-19-25.2	20.3852	19.4496	-8.6238	6.14	3.44	1.000	17.60
24 JAN 1991	8280.50	18 48	19.6	-23-18-4.6	20.3569	19.4505	-10.9408	6.14	3.44	1.000	22.40
29 JAN 1991	8285.50	18 49	32.3	-23-16-44.4	20.3221	19.4514	-13.1664	6.13	3.45	1.000	27.21
3 FEB 1991	8290.50	18 50	42.5	-23-15-25.5	20.2809	19.4523	-15.3013	6.13	3.45	1.000	32.01
8 FEB 1991	8295.50	18 51	50.2	-23-14-8.0	20.2338	19.4531	-17.3426	6.13	3.46	1.000	36.82
13 FEB 1991	8300.50	18 52	54.8	-23-12-53.0	20.1809	19.4540	-19.2682	6.12	3.47	1.000	41.63
18 FEB 1991	8305.50	18 53	58.0	-23-11-41.2	20.1226	19.4549	-21.0516	6.11	3.48	1.000	46.45
23 FEB 1991	8310.50	18 54	53.5	-23-10-32.8	20.0595	19.4558	-22.6715	6.11	3.49	1.000	51.27
28 FEB 1991	8315.50	18 55	46.9	-23-9-29.1	19.9919	19.4567	-24.1236	6.10	3.50	1.000	56.09
5 MAR 1991	8320.50	18 56	36.1	-23-8-30.2	19.9203	19.4576	-25.4148	6.09	3.52	1.000	60.92
10 MAR 1991	8325.50	18 57	20.7	-23-7-36.7	19.8452	19.4585	-26.5382	6.08	3.53	0.999	65.75
15 MAR 1991	8330.50	18 58	0.5	-23-6-49.5	19.7672	19.4594	-27.4721	6.08	3.54	0.999	70.59
20 MAR 1991	8335.50	18 58	35.2	-23-6-8.6	19.6868	19.4603	-28.1970	6.07	3.56	0.999	75.43
25 MAR 1991	8340.50	18 59	4.8	-23-5-34.8	19.6046	19.4611	-28.7070	6.06	3.57	0.999	80.28
30 MAR 1991	8345.50	18 59	29.0	-23-5-8.6	19.5212	19.4620	-29.0128	6.05	3.59	0.999	85.13
4 APR 1991	8350.50	18 59	47.8	-23-4-49.6	19.4372	19.4629	-29.1228	6.04	3.60	0.999	90.00
9 APR 1991	8355.50	19 0	1.1	-23-4-38.6	19.3532	19.4638	-29.0287	6.03	3.62	0.999	94.88
14 APR 1991	8360.50	19 0	8.9	-23-4-35.6	19.2698	19.4647	-28.7154	6.02	3.63	0.999	99.74
19 APR 1991	8365.50	19 0	11.0	-23-4-40.2	19.1876	19.4656	-28.1761	6.01	3.65	0.999	104.63
24 APR 1991	8370.50	19 0	7.7	-23-4-53.1	19.1072	19.4665	-27.4245	6.00	3.67	0.999	109.52
29 APR 1991	8375.50	18 59	58.9	-23-5-13.3	19.0293	19.4674	-26.4802	5.99	3.68	0.999	114.42
4 MAY 1991	8380.50	18 59	45.0	-23-5-40.8	18.9545	19.4682	-25.3509	5.99	3.70	0.999	119.33
9 MAY 1991	8385.50	18 59	25.9	-23-6-15.4	18.8831	19.4691	-24.0325	5.98	3.71	1.000	124.24
14 MAY 1991	8390.50	18 59	1.8	-23-6-56.4	18.8159	19.4700	-22.5193	5.97	3.72	1.000	129.17
19 MAY 1991	8395.50	18 58	33.2	-23-7-43.4	18.7532	19.4709	-20.8232	5.96	3.73	1.000	134.10
24 MAY 1991	8400.50	18 58	0.2	-23-8-36.0	18.6957	19.4718	-18.9738	5.96	3.75	1.000	139.04
29 MAY 1991	8405.50	18 57	23.2	-23-9-32.8	18.6438	19.4727	-16.9925	5.95	3.76	1.000	143.98
3 JUN 1991	8410.50	18 56	42.7	-23-10-33.8	18.5977	19.4736	-14.8870	5.94	3.77	1.000	148.93
8 JUN 1991	8415.50	18 55	58.9	-23-11-38.0	18.5579	19.4744	-12.8694	5.94	3.77	1.000	153.88
13 JUN 1991	8420.50	18 55	12.4	-23-12-44.4	18.5247	19.4753	-10.3171	5.94	3.78	1.000	158.84
18 JUN 1991	8425.50	18 54	23.7	-23-13-52.7	18.4984	19.4762	-7.8900	5.93	3.79	1.000	163.81
23 JUN 1991	8430.50	18 53	33.2	-23-15-1.6	18.4792	19.4771	-5.4133	5.93	3.79	1.000	168.77
28 JUN 1991	8435.50	18 52	41.5	-23-16-10.4	18.4672	19.4780	-2.9035	5.93	3.79	1.000	173.73
3 JUL 1991	8440.50	18 51	49.0	-23-17-18.8	18.4624	19.4789	-0.3689	5.93	3.79	1.000	178.66
8 JUL 1991	8445.50	18 50	56.4	-23-18-25.5	18.4651	19.4797	2.1833	5.93	3.79	1.000	-178.30
13 JUL 1991	8450.50	18 50	4.2	-23-19-30.2	18.4751	19.4806	4.7330	5.93	3.79	1.000	-171.34
18 JUL 1991	8455.50	18 49	12.8	-23-20-32.4	18.4924	19.4815	7.2415	5.93	3.79	1.000	-166.38

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1991	8460.50	18 48 23.0	-23-21-31.0	18.5168	19.4824	9.6816	5.94	3.78	1.000	-161.41	
28 JUL 1991	8465.50	18 47 35.1	-23-22-26.1	18.5482	19.4833	12.0461	5.94	3.78	1.000	-156.46	
2 AUG 1991	8470.50	18 46 49.7	-23-23-17.1	18.5863	19.4842	14.3264	5.94	3.77	1.000	-151.50	
7 AUG 1991	8475.50	18 46 7.1	-23-24-3.4	18.6309	19.4850	16.5149	5.95	3.78	1.000	-146.55	
12 AUG 1991	8480.50	18 45 27.9	-23-24-45.2	18.6818	19.4859	18.5832	5.96	3.75	1.000	-141.61	
17 AUG 1991	8485.50	18 44 52.5	-23-25-21.7	18.7380	19.4868	20.4992	5.96	3.74	1.000	-136.67	
22 AUG 1991	8490.50	18 44 21.3	-23-25-52.9	18.7998	19.4877	22.2514	5.97	3.73	1.000	-131.74	
27 AUG 1991	8495.50	18 43 54.5	-23-26-19.0	18.8684	19.4886	23.8422	5.98	3.71	1.000	-126.82	
1 SEP 1991	8500.50	18 43 32.5	-23-26-39.2	18.9373	19.4895	25.2702	5.99	3.70	1.000	-121.90	
6 SEP 1991	8505.50	18 43 15.5	-23-26-54.1	19.0122	19.4903	26.5227	5.99	3.68	0.999	-116.99	
11 SEP 1991	8510.50	18 43 3.6	-23-27-3.3	19.0903	19.4912	27.5746	6.00	3.67	0.999	-112.09	
16 SEP 1991	8515.50	18 42 57.2	-23-27-8.5	19.1712	19.4921	28.4109	6.01	3.65	0.999	-107.20	
21 SEP 1991	8520.50	18 42 58.2	-23-27-4.3	19.2542	19.4930	29.0370	6.02	3.64	0.999	-102.32	
26 SEP 1991	8525.50	18 43 0.7	-23-28-56.1	19.3387	19.4939	29.4642	6.03	3.62	0.999	-97.44	
1 OCT 1991	8530.50	18 43 10.8	-23-28-42.1	19.4242	19.4947	29.6937	6.04	3.61	0.999	-92.57	
6 OCT 1991	8535.50	18 43 26.5	-23-28-22.6	19.5100	19.4956	29.7123	6.05	3.59	0.999	-87.71	
11 OCT 1991	8540.50	18 43 47.6	-23-28-57.0	19.5956	19.4965	29.5069	6.06	3.57	0.999	-82.86	
16 OCT 1991	8545.50	18 44 14.3	-23-28-25.7	19.6802	19.4974	29.0815	6.07	3.56	0.999	-78.01	
21 OCT 1991	8550.50	18 44 46.1	-23-24-48.8	19.7633	19.4983	28.4542	6.08	3.54	0.999	-73.17	
26 OCT 1991	8555.50	18 45 23.0	-23-24-5.8	19.8444	19.4991	27.6416	6.09	3.53	0.999	-68.33	
31 OCT 1991	8560.50	18 46 4.9	-23-23-17.3	19.9228	19.5000	26.6441	6.10	3.52	0.999	-63.50	
5 NOV 1991	8565.50	18 46 51.4	-23-22-23.2	19.9981	19.5009	25.4525	6.11	3.50	1.000	-58.68	
10 NOV 1991	8570.50	18 47 42.4	-23-21-23.1	20.0696	19.5018	24.0704	6.11	3.49	1.000	-53.85	
15 NOV 1991	8575.50	18 48 37.6	-23-20-17.8	20.1369	19.5026	22.5170	6.12	3.48	1.000	-49.03	
20 NOV 1991	8580.50	18 49 36.6	-23-19-6.9	20.1995	19.5035	20.8178	6.13	3.47	1.000	-44.22	
25 NOV 1991	8585.50	18 50 39.1	-23-17-50.6	20.2570	19.5044	18.9895	6.13	3.46	1.000	-39.41	
30 NOV 1991	8590.50	18 51 44.8	-23-16-29.6	20.3091	19.5053	17.0301	6.14	3.45	1.000	-34.60	
5 DEC 1991	8595.50	18 52 53.4	-23-15-3.3	20.3553	19.5062	14.9401	6.14	3.44	1.000	-29.80	
10 DEC 1991	8600.50	18 54 4.4	-23-13-32.5	20.3953	19.5070	12.7391	6.15	3.43	1.000	-24.99	
15 DEC 1991	8605.50	18 55 17.5	-23-11-57.6	20.4288	19.5079	10.4545	6.15	3.43	1.000	-20.19	
20 DEC 1991	8610.50	18 56 32.3	-23-10-18.4	20.4556	19.5088	8.1132	6.16	3.42	1.000	-15.39	
25 DEC 1991	8615.50	18 57 48.4	-23-8-36.0	20.4756	19.5097	5.7269	6.16	3.42	1.000	-10.60	
30 DEC 1991	8620.50	18 59 5.3	-23-6-50.4	20.4886	19.5105	3.2930	6.16	3.42	1.000	-5.80	

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1992	8625.50	19 0 22.7	-23 5	-2.1	20.4946	19.5114	0.8249	6.16	3.42	1.000	-1.06
9 JAN 1992	8630.50	19 1 40.2	-23 3	-12.1	20.4934	19.5123	-1.6488	6.16	3.42	1.000	3.82
14 JAN 1992	8635.50	19 2 57.3	-23 1	-20.6	20.4851	19.5132	-4.0996	6.16	3.42	1.000	8.61
19 JAN 1992	8640.50	19 4 13.7	-22 59	-28.3	20.4697	19.5140	-6.5057	6.16	3.42	1.000	13.41
24 JAN 1992	8645.50	19 5 28.9	-22 57	-36.3	20.4475	19.5149	-8.8644	6.16	3.43	1.000	18.20
29 JAN 1992	8650.50	19 6 42.5	-22 55	-44.7	20.4186	19.5158	-11.1743	6.15	3.43	1.000	23.00
3 FEB 1992	8655.50	19 7 54.2	-22 53	-54.6	20.3831	19.5167	-13.4128	6.15	3.44	1.000	27.80
8 FEB 1992	8660.50	19 9 3.5	-22 52	-6.9	20.3412	19.5175	-15.5504	6.14	3.44	1.000	32.60
13 FEB 1992	8665.50	19 10 10.1	-22 50	-22.0	20.2934	19.5184	-17.5845	6.14	3.45	1.000	37.41
18 FEB 1992	8670.50	19 11 13.7	-22 48	-41.2	20.2399	19.5193	-19.4454	6.13	3.46	1.000	42.21
23 FEB 1992	8675.50	19 12 13.8	-22 47	-5.0	20.1812	19.5202	-21.1975	6.13	3.47	1.000	47.02
28 FEB 1992	8680.50	19 13 10.3	-22 45	-33.9	20.1176	19.5210	-22.8139	6.12	3.48	1.000	51.83
4 MAR 1992	8685.50	19 14 2.8	-22 44	-9.3	20.0496	19.5219	-24.2695	6.11	3.49	1.000	56.64
9 MAR 1992	8690.50	19 14 50.9	-22 42	-51.3	19.9776	19.5228	-25.5414	6.11	3.51	0.999	61.46
14 MAR 1992	8695.50	19 15 34.5	-22 41	-41.0	19.9023	19.5237	-26.6191	6.10	3.52	0.999	66.28
19 MAR 1992	8700.50	19 16 13.3	-22 40	-39.0	19.8241	19.5245	-27.5078	6.09	3.53	0.999	71.11
24 MAR 1992	8705.50	19 16 47.2	-22 39	-45.3	19.7436	19.5254	-28.2140	6.08	3.55	0.999	75.94
29 MAR 1992	8710.50	19 17 15.9	-22 38	-1.0	19.6613	19.5263	-28.7274	6.07	3.58	0.999	80.78
3 APR 1992	8715.50	19 17 39.3	-22 36	-26.4	19.5779	19.5271	-29.0278	6.06	3.58	0.999	85.63
8 APR 1992	8720.50	19 17 57.4	-22 34	-1.4	19.4939	19.5280	-29.1042	6.05	3.59	0.999	90.48
13 APR 1992	8725.50	19 18 10.0	-22 37	-46.8	19.4100	19.5289	-28.9630	6.04	3.61	0.999	95.34
18 APR 1992	8730.50	19 18 17.0	-22 37	-42.2	19.3268	19.5298	-28.6206	6.03	3.62	0.999	100.20
23 APR 1992	8735.50	19 18 18.7	-22 37	-47.6	19.2449	19.5306	-28.0821	6.03	3.64	0.999	105.07
28 APR 1992	8740.50	19 18 14.9	-22 38	-3.3	19.1648	19.5315	-27.3389	6.02	3.65	0.999	109.95
3 MAY 1992	8745.50	19 18 5.8	-22 38	-28.6	19.0872	19.5324	-26.3811	6.01	3.67	0.999	114.85
8 MAY 1992	8750.50	19 17 51.5	-22 39	-3.4	19.0128	19.5332	-25.2139	6.00	3.68	0.999	119.75
13 MAY 1992	8755.50	19 17 32.1	-22 39	-47.3	18.9417	19.5341	-23.8612	5.99	3.70	1.000	124.65
18 MAY 1992	8760.50	19 17 7.9	-22 40	-39.3	18.8750	19.5350	-22.3429	5.98	3.71	1.000	129.56
23 MAY 1992	8765.50	19 16 39.2	-22 41	-39.3	18.8129	19.5358	-20.6632	5.98	3.72	1.000	134.48
28 MAY 1992	8770.50	19 16 6.2	-22 42	-46.3	18.7558	19.5367	-18.8203	5.97	3.73	1.000	139.41
2 JUN 1992	8775.50	19 15 29.3	-22 43	-59.4	18.7043	19.5376	-16.8179	5.96	3.74	1.000	144.35
7 JUN 1992	8780.50	19 14 48.9	-22 45	-18.0	18.6588	19.5384	-14.8792	5.96	3.75	1.000	149.30
12 JUN 1992	8785.50	19 14 5.3	-22 46	-40.8	18.6196	19.5393	-12.4384	5.95	3.76	1.000	154.24
17 JUN 1992	8790.50	19 13 19.1	-22 48	-6.9	18.5870	19.5402	-10.1122	5.95	3.77	1.000	159.20
22 JUN 1992	8795.50	19 12 30.7	-22 49	-35.6	18.5613	19.5410	-7.7061	5.95	3.77	1.000	164.15
27 JUN 1992	8800.50	19 11 40.5	-22 51	-5.6	18.5426	19.5419	-5.2268	5.95	3.78	1.000	169.11
2 JUL 1992	8805.50	19 10 49.2	-22 52	-36.1	18.5312	19.5428	-2.8915	5.94	3.78	1.000	174.08
7 JUL 1992	8810.50	19 9 57.1	-22 54	-6.2	18.5271	19.5436	-0.1365	5.94	3.78	1.000	178.97
12 JUL 1992	8815.50	19 9 5.0	-22 55	-34.5	18.5304	19.5445	2.4066	5.94	3.78	1.000	-175.95
17 JUL 1992	8820.50	19 8 13.3	-22 57	-0.7	18.5410	19.5454	4.9282	5.95	3.78	1.000	-170.99

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2449999+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1992	8825.50	19 7	22.5	-22-58-23.7	18.5588	19.5462	7.4219	5.95	3.77	1.000	-166.03
27 JUL 1992	8830.50	19 6	33.2	-22-59-42.6	18.5838	19.5471	9.8748	5.95	3.77	1.000	-161.07
1 AUG 1992	8835.50	19 5	45.8	-23 0-57.2	18.6158	19.5480	12.2604	5.96	3.76	1.000	-158.10
6 AUG 1992	8840.50	19 5	0.9	-23 -2 -6.3	18.6545	19.5488	14.5423	5.96	3.75	1.000	-151.14
11 AUG 1992	8845.50	19 4	19.0	-23 -3 -9.5	18.6996	19.5497	16.7027	5.96	3.75	1.000	-146.19
16 AUG 1992	8850.50	19 3	40.4	-23 -4 -6.7	18.7508	19.5506	18.7412	5.97	3.74	1.000	-141.24
21 AUG 1992	8855.50	19 3	5.6	-23 -4-56.9	18.8078	19.5514	20.6524	5.98	3.72	1.000	-136.29
26 AUG 1992	8860.50	19 2	34.9	-23 -5-40.2	18.8700	19.5523	22.4209	5.98	3.71	1.000	-131.36
31 AUG 1992	8865.50	19 2	8.6	-23 -6-16.2	18.9371	19.5531	24.0191	5.99	3.70	1.000	-126.42
5 SEP 1992	8870.50	19 1	47.1	-23 -6-44.4	19.0085	19.5540	25.4243	6.00	3.68	1.000	-121.50
10 SEP 1992	8875.50	19 1	30.6	-23 -7 -5.0	19.0837	19.5549	26.6366	6.01	3.67	0.999	-116.58
15 SEP 1992	8880.50	19 1	19.3	-23 -7-17.6	19.1622	19.5557	27.6633	6.02	3.66	0.999	-111.67
20 SEP 1992	8885.50	19 1	13.3	-23 -7-22.1	19.2433	19.5566	28.5018	6.03	3.64	0.999	-106.77
25 SEP 1992	8890.50	19 1	12.7	-23 -7-18.9	19.3266	19.5574	29.1364	6.04	3.62	0.999	-101.87
30 SEP 1992	8895.50	19 1	17.7	-23 -7 -7.2	19.4114	19.5583	29.5484	6.05	3.61	0.999	-96.98
5 OCT 1992	8900.50	19 1	28.2	-23 -6-47.3	19.4970	19.5592	29.7352	6.06	3.59	0.999	-92.10
10 OCT 1992	8905.50	19 1	44.2	-23 -6-19.5	19.5829	19.5600	29.7111	6.07	3.58	0.999	-87.23
15 OCT 1992	8910.50	19 2	5.7	-23 -6-43.4	19.6684	19.5609	29.4889	6.08	3.56	0.999	-82.37
20 OCT 1992	8915.50	19 2	32.5	-23 -4-59.4	19.7530	19.5617	29.0671	6.09	3.55	0.999	-77.51
25 OCT 1992	8920.50	19 3	4.6	-23 -4 -7.5	19.8361	19.5626	28.4331	6.09	3.53	0.999	-72.65
30 OCT 1992	8925.50	19 3	41.7	-23 -3 -7.4	19.9171	19.5635	27.5845	6.10	3.52	0.999	-67.80
4 NOV 1992	8930.50	19 4	23.7	-23 -1-59.8	19.9952	19.5643	26.5368	6.11	3.50	0.999	-62.96
9 NOV 1992	8935.50	19 5	10.3	-23 0-44.5	20.0701	19.5652	25.3123	6.12	3.49	1.000	-58.12
14 NOV 1992	8940.50	19 6	1.3	-22-59-21.7	20.1413	19.5660	23.9258	6.13	3.48	1.000	-53.29
19 NOV 1992	8945.50	19 6	56.3	-22-57-52.0	20.2082	19.5669	22.3749	6.14	3.47	1.000	-48.47
24 NOV 1992	8950.50	19 7	55.2	-22-56-15.0	20.2703	19.5677	20.6556	6.14	3.46	1.000	-43.64
29 NOV 1992	8955.50	19 8	57.5	-22-54-31.4	20.3273	19.5686	18.7834	6.15	3.45	1.000	-38.82
4 DEC 1992	8960.50	19 10	3.0	-22-52-41.7	20.3787	19.5694	16.7847	6.16	3.44	1.000	-34.01
9 DEC 1992	8965.50	19 11	11.2	-22-50-45.9	20.4242	19.5703	14.6841	6.16	3.43	1.000	-29.19
14 DEC 1992	8970.50	19 12	21.8	-22-48-44.8	20.4634	19.5712	12.4942	6.16	3.42	1.000	-24.39
19 DEC 1992	8975.50	19 13	34.3	-22-46-38.7	20.4962	19.5720	10.2121	6.17	3.42	1.000	-19.58
24 DEC 1992	8980.50	19 14	48.6	-22-44-27.8	20.5223	19.5729	7.8467	6.17	3.41	1.000	-14.78
29 DEC 1992	8985.50	19 16	4.0	-22-42-13.4	20.5415	19.5737	5.4266	6.17	3.41	1.000	-9.98

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (^m)	PHASE	ELONG
3 JAN 1993	8990.50	19 17 20.2	-22-39-55.7	20.5536	19.5746	2.9804	6.17	3.41	1.000	1.000	-5.18
8 JAN 1993	8995.50	19 18 36.9	-22-37-35.4	20.5587	19.5754	0.5298	6.17	3.41	1.000	1.000	-0.55
13 JAN 1993	9000.50	19 19 53.5	-22-35-13.6	20.5587	19.5763	-1.9191	6.17	3.41	1.000	1.000	4.45
18 JAN 1993	9005.50	19 21 9.7	-22-32-50.5	20.5476	19.5771	-4.3662	6.17	3.41	1.000	1.000	9.23
23 JAN 1993	9010.50	19 22 25.1	-22-30-27.3	20.5315	19.5780	-6.7905	6.17	3.41	1.000	1.000	14.03
28 JAN 1993	9015.50	19 23 39.3	-22-28-4.9	20.5085	19.5788	-9.1599	6.17	3.42	1.000	1.000	18.82
2 FEB 1993	9020.50	19 24 51.9	-22-25-44.0	20.4787	19.5797	-11.4504	6.17	3.42	1.000	1.000	23.62
7 FEB 1993	9025.50	19 26 2.5	-22-23-25.7	20.4424	19.5805	-13.6493	6.16	3.43	1.000	1.000	28.41
12 FEB 1993	9030.50	19 27 10.7	-22-21-10.8	20.3999	19.5814	-15.7574	6.16	3.43	1.000	1.000	33.20
17 FEB 1993	9035.50	19 28 16.2	-22-18-00.0	20.3515	19.5822	-17.7690	6.15	3.44	1.000	1.000	38.00
22 FEB 1993	9040.50	19 29 18.7	-22-16-54.7	20.2974	19.5831	-19.6570	6.15	3.45	1.000	1.000	42.80
27 FEB 1993	9045.50	19 30 17.7	-22-14-55.5	20.2381	19.5839	-21.3947	6.14	3.46	1.000	1.000	47.60
4 MAR 1993	9050.50	19 31 13.1	-22-13-3.3	20.1740	19.5848	-22.9685	6.13	3.47	1.000	1.000	52.40
9 MAR 1993	9055.50	19 32 4.4	-22-11-19.3	20.1056	19.5856	-24.3783	6.13	3.48	1.000	1.000	57.20
14 MAR 1993	9060.50	19 32 51.5	-22-9-43.7	20.0334	19.5865	-25.6288	6.12	3.50	0.999	0.999	62.01
19 MAR 1993	9065.50	19 33 34.1	-22-8-17.7	19.9578	19.5873	-26.7084	6.11	3.51	0.999	0.999	66.82
24 MAR 1993	9070.50	19 34 11.9	-22-7-1.9	19.8793	19.5882	-27.5927	6.10	3.52	0.999	0.999	71.64
29 MAR 1993	9075.50	19 34 44.8	-22-5-56.7	19.7986	19.5890	-28.2662	6.09	3.54	0.999	0.999	76.46
3 APR 1993	9080.50	19 35 12.6	-22-5-3.0	19.7163	19.5899	-28.7302	6.08	3.55	0.999	0.999	81.29
8 APR 1993	9085.50	19 35 35.2	-22-4-21.0	19.6329	19.5907	-28.9961	6.08	3.57	0.999	0.999	86.12
13 APR 1993	9090.50	19 35 52.5	-22-3-50.7	19.5490	19.5915	-29.0677	6.07	3.58	0.999	0.999	90.96
18 APR 1993	9095.50	19 36 4.4	-22-3-32.9	19.4652	19.5924	-28.9322	6.06	3.60	0.999	0.999	95.81
23 APR 1993	9100.50	19 36 10.9	-22-3-27.3	19.3821	19.5932	-28.5753	6.05	3.61	0.999	0.999	100.66
28 APR 1993	9105.50	19 36 12.0	-22-3-34.0	19.3004	19.5941	-27.9984	6.04	3.63	0.999	0.999	105.53
3 MAY 1993	9110.50	19 36 7.7	-22-3-53.1	19.2206	19.5949	-27.2128	6.03	3.64	0.999	0.999	110.40
8 MAY 1993	9115.50	19 35 58.2	-22-4-23.6	19.1434	19.5958	-26.2424	6.02	3.66	0.999	0.999	115.28
13 MAY 1993	9120.50	19 35 43.6	-22-5-5.6	19.0692	19.5966	-25.0864	6.01	3.67	0.999	0.999	120.17
18 MAY 1993	9125.50	19 35 24.0	-22-5-58.7	18.9987	19.5974	-23.7380	6.00	3.69	1.000	1.000	125.07
23 MAY 1993	9130.50	19 34 59.7	-22-7-1.7	18.9323	19.5983	-22.1967	6.00	3.70	1.000	1.000	129.97
28 MAY 1993	9135.50	19 34 30.9	-22-8-14.5	18.8707	19.5991	-20.4791	5.99	3.71	1.000	1.000	134.89
2 JUN 1993	9140.50	19 33 57.9	-22-9-35.7	18.8142	19.6000	-18.6154	5.98	3.72	1.000	1.000	139.81
7 JUN 1993	9145.50	19 33 21.1	-22-11-4.4	18.7633	19.6008	-16.6226	5.98	3.73	1.000	1.000	144.74
12 JUN 1993	9150.50	19 32 40.9	-22-12-39.9	18.7183	19.6016	-14.5020	5.97	3.74	1.000	1.000	149.68
17 JUN 1993	9155.50	19 31 57.6	-22-14-20.7	18.6796	19.6025	-12.2577	5.97	3.75	1.000	1.000	154.62
22 JUN 1993	9160.50	19 31 11.8	-22-16-5.9	18.6476	19.6033	-9.9035	5.96	3.76	1.000	1.000	159.58
27 JUN 1993	9165.50	19 30 23.5	-22-17-54.5	18.6225	19.6042	-7.4712	5.96	3.76	1.000	1.000	164.53
2 JUL 1993	9170.50	19 29 33.8	-22-19-44.7	18.6045	19.6050	-4.9941	5.96	3.76	1.000	1.000	169.49
7 JUL 1993	9175.50	19 28 43.0	-22-21-35.9	18.5937	19.6058	-2.4829	5.96	3.77	1.000	1.000	174.44
12 JUL 1993	9180.50	19 27 51.5	-22-23-26.7	18.5902	19.6067	0.0578	5.96	3.77	1.000	1.000	179.26
17 JUL 1993	9185.50	19 26 59.9	-22-25-15.8	18.5940	19.6075	2.6143	5.96	3.77	1.000	1.000	-175.57

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1993	9190.50	19 26	8.7	-22-27 -2.6	18.6053	19.6083	5.1615	5.96	3.76	1.000	-170.61
27 JUL 1993	9195.50	19 25	18.5	-22-28-45.5	18.6238	19.6092	7.6621	5.96	3.76	1.000	-165.84
1 AUG 1993	9200.50	19 24	29.8	-22-30-23.7	18.6495	19.6100	10.0922	5.97	3.76	1.000	-160.68
6 AUG 1993	9205.50	19 23	43.1	-22-31-56.5	18.6820	19.6109	12.4493	5.97	3.75	1.000	-155.71
11 AUG 1993	9210.50	19 22	58.9	-22-33-22.9	18.7213	19.6117	14.7262	5.97	3.74	1.000	-150.75
16 AUG 1993	9215.50	19 22	17.5	-22-34-42.2	18.7670	19.6125	16.9046	5.98	3.73	1.000	-145.79
21 AUG 1993	9220.50	19 21	39.6	-22-35-53.9	18.8188	19.6134	18.9554	5.99	3.72	1.000	-140.83
26 AUG 1993	9225.50	19 21	5.4	-22-36-56.9	18.8763	19.6142	20.8496	5.99	3.71	1.000	-135.87
31 AUG 1993	9230.50	19 20	35.3	-22-37-51.4	18.9391	19.6150	22.5808	6.00	3.70	1.000	-130.93
5 SEP 1993	9235.50	19 20	9.7	-22-38-36.5	19.0066	19.6158	24.1536	6.01	3.69	1.000	-125.99
10 SEP 1993	9240.50	19 19	48.8	-22-39-12.0	19.0784	19.6167	25.5612	6.02	3.67	1.000	-121.05
15 SEP 1993	9245.50	19 19	32.8	-22-39-37.8	19.1540	19.6175	26.7850	6.02	3.66	0.999	-116.13
20 SEP 1993	9250.50	19 19	22.0	-22-39-53.4	19.2329	19.6183	27.8015	6.03	3.84	0.999	-111.20
25 SEP 1993	9255.50	19 19	16.6	-22-39-58.6	19.3144	19.6192	28.6009	6.04	3.63	0.999	-106.29
30 SEP 1993	9260.50	19 19	16.5	-22-39-53.7	19.3979	19.6200	29.1927	6.05	3.61	0.999	-101.38
5 OCT 1993	9265.50	19 19	21.9	-22-39-38.2	19.4828	19.6208	29.5863	6.06	3.60	0.999	-96.49
10 OCT 1993	9270.50	19 19	32.8	-22-39-12.3	19.5686	19.6217	29.7768	6.07	3.58	0.999	-91.60
15 OCT 1993	9275.50	19 19	49.2	-22-38-36.2	19.6546	19.6225	29.7487	6.08	3.58	0.999	-86.71
20 OCT 1993	9280.50	19 20	11.0	-22-37-49.4	19.7401	19.6233	29.4930	6.09	3.55	0.999	-81.83
25 OCT 1993	9285.50	19 20	38.1	-22-36-52.6	19.8247	19.6241	29.0201	6.10	3.53	0.999	-76.96
30 OCT 1993	9290.50	19 21	10.3	-22-35-45.7	19.9076	19.6250	28.3494	6.11	3.52	0.999	-72.09
4 NOV 1993	9295.50	19 21	47.6	-22-34-28.7	19.9882	19.6258	27.4925	6.12	3.50	0.999	-67.24
9 NOV 1993	9300.50	19 22	29.6	-22-33 -2.4	20.0682	19.6266	26.4457	6.13	3.49	1.000	-62.39
14 NOV 1993	9305.50	19 23	16.2	-22-31-26.4	20.1408	19.6274	25.2009	6.13	3.48	1.000	-57.54
19 NOV 1993	9310.50	19 24	7.1	-22-29-41.3	20.2115	19.6283	23.7680	6.14	3.47	1.000	-52.69
24 NOV 1993	9315.50	19 25	2.1	-22-27-47.6	20.2779	19.6291	22.1716	6.15	3.45	1.000	-47.86
29 NOV 1993	9320.50	19 26	0.7	-22-25-45.3	20.3394	19.6299	20.4339	6.16	3.44	1.000	-43.03
4 DEC 1993	9325.50	19 27	2.7	-22-23-35.4	20.3958	19.6307	18.5684	6.16	3.43	1.000	-38.20
9 DEC 1993	9330.50	19 28	7.7	-22-21-18.0	20.4465	19.6316	16.5663	6.17	3.43	1.000	-33.38
14 DEC 1993	9335.50	19 29	15.5	-22-18-53.6	20.4913	19.6324	14.4375	6.17	3.42	1.000	-28.56
19 DEC 1993	9340.50	19 30	25.6	-22-16-23.1	20.5298	19.6332	12.2064	6.18	3.41	1.000	-23.75
24 DEC 1993	9345.50	19 31	37.6	-22-13-47.0	20.5618	19.6340	9.9020	6.18	3.41	1.000	-18.94
29 DEC 1993	9350.50	19 32	51.1	-22-11 -5.9	20.5870	19.6348	7.5447	6.18	3.40	1.000	-14.13

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	19 34	5.8	-22 -8-21.0	20.6053	19.6357	5.1427	6.19	3.40	1.000	-9.33
8 JAN 1994	9360.50	19 35	21.1	-22 -5-32.6	20.6166	19.6385	2.6955	6.19	3.40	1.000	-4.54
13 JAN 1994	9365.50	19 36	38.9	-22 -2-41.7	20.6208	19.6373	0.2208	6.19	3.40	1.000	0.53
18 JAN 1994	9370.50	19 37	52.8	-21 -59-49.5	20.6179	19.6381	-2.2481	6.19	3.40	1.000	5.10
23 JAN 1994	9375.50	19 39	7.8	-21 -50-56.5	20.6079	19.6389	-4.6852	6.19	3.40	1.000	9.88
28 JAN 1994	9380.50	19 40	22.2	-21 -54 -4.1	20.5909	19.6397	-7.0768	6.18	3.40	1.000	14.67
2 FEB 1994	9385.50	19 41	35.2	-21 -51-13.2	20.5871	19.6406	-9.4202	6.18	3.41	1.000	19.45
7 FEB 1994	9390.50	19 42	46.7	-21 -48-24.5	20.5365	19.6414	-11.7109	6.18	3.41	1.000	24.24
12 FEB 1994	9395.50	19 43	56.1	-21 -45-39.6	20.4995	19.6422	-13.9218	6.17	3.42	1.000	29.03
17 FEB 1994	9400.50	19 45	3.2	-21 -42-59.1	20.4562	19.6430	-16.0221	6.17	3.42	1.000	33.82
22 FEB 1994	9405.50	19 46	7.5	-21 -40-24.3	20.4071	19.6438	-17.9960	6.17	3.43	1.000	38.61
27 FEB 1994	9410.50	19 47	8.7	-21 -37-58.3	20.3524	19.6446	-19.8395	6.16	3.44	1.000	43.40
4 MAR 1994	9415.50	19 48	6.6	-21 -35-35.8	20.2926	19.6455	-21.5544	6.15	3.45	1.000	48.18
9 MAR 1994	9420.50	19 49	0.8	-21 -33-23.9	20.2281	19.6463	-23.1296	6.15	3.46	1.000	52.98
14 MAR 1994	9425.50	19 49	51.0	-21 -31-21.9	20.1592	19.6471	-24.5371	6.14	3.47	1.000	57.77
19 MAR 1994	9430.50	19 50	36.9	-21 -29-30.1	20.0865	19.6479	-25.7570	6.13	3.49	0.999	62.57
24 MAR 1994	9435.50	19 51	18.4	-21 -27-49.9	20.0106	19.6487	-26.7865	6.12	3.50	0.999	67.37
29 MAR 1994	9440.50	19 51	55.1	-21 -26-21.7	19.9320	19.6495	-27.8321	6.11	3.51	0.999	72.18
3 APR 1994	9445.50	19 52	27.1	-21 -25 -6.0	19.8512	19.6503	-28.2962	6.11	3.53	0.999	76.99
8 APR 1994	9450.50	19 52	54.0	-21 -24 -3.8	19.7688	19.6511	-28.7637	6.10	3.54	0.999	81.80
13 APR 1994	9455.50	19 53	15.7	-21 -23-15.2	19.6853	19.6519	-29.0148	6.09	3.56	0.999	86.63
18 APR 1994	9460.50	19 53	32.2	-21 -22-40.7	19.6014	19.6527	-29.0443	6.08	3.57	0.999	91.46
23 APR 1994	9465.50	19 53	43.4	-21 -22-20.6	19.5178	19.6536	-28.8636	6.07	3.59	0.999	96.30
28 APR 1994	9470.50	19 53	49.2	-21 -22-14.5	19.4349	19.6544	-28.4871	6.06	3.60	0.999	101.14
3 MAY 1994	9475.50	19 53	49.8	-21 -22-22.8	19.3534	19.6552	-27.9142	6.05	3.62	0.999	105.99
8 MAY 1994	9480.50	19 53	45.1	-21 -22-46.3	19.2739	19.6560	-27.1331	6.04	3.63	0.999	110.86
13 MAY 1994	9485.50	19 53	35.2	-21 -23-21.4	19.1969	19.6568	-26.1381	6.03	3.65	0.999	115.73
18 MAY 1994	9490.50	19 53	20.2	-21 -24-10.9	19.1231	19.6576	-24.9402	6.03	3.66	1.000	120.61
23 MAY 1994	9495.50	19 53	0.4	-21 -25-13.0	19.0530	19.6584	-23.5639	6.02	3.68	1.000	125.50
28 MAY 1994	9500.50	19 52	36.0	-21 -26-26.8	18.9872	19.6592	-22.0255	6.01	3.69	1.000	130.40
2 JUN 1994	9505.50	19 52	7.3	-21 -27-51.8	18.9260	19.6600	-20.3229	6.00	3.70	1.000	135.31
7 JUN 1994	9510.50	19 51	34.3	-21 -29-26.8	18.8700	19.6608	-18.4547	6.00	3.71	1.000	140.22
12 JUN 1994	9515.50	19 50	57.7	-21 -31-10.7	18.8196	19.6616	-16.4315	5.99	3.72	1.000	145.15
17 JUN 1994	9520.50	19 50	17.6	-21 -33 -2.6	18.7752	19.6624	-14.2793	5.98	3.73	1.000	150.09
22 JUN 1994	9525.50	19 49	34.6	-21 -35 -0.7	18.7372	19.6632	-12.0300	5.98	3.74	1.000	155.03
27 JUN 1994	9530.50	19 48	49.1	-21 -37 -4.1	18.7058	19.6640	-9.6954	5.98	3.74	1.000	159.97
2 JUL 1994	9535.50	19 48	1.4	-21 -39-11.4	18.6813	19.6648	-7.2765	5.98	3.75	1.000	164.93
7 JUL 1994	9540.50	19 47	12.1	-21 -41-21.1	18.6537	19.6656	-4.7852	5.97	3.75	1.000	169.88
12 JUL 1994	9545.50	19 46	21.8	-21 -43-32.0	18.6263	19.6664	-2.2450	5.97	3.75	1.000	174.84
17 JUL 1994	9550.50	19 45	30.8	-21 -45-42.6	18.6009	19.6672	0.3089	5.97	3.76	1.000	179.45

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1994	9555.50	19 44 39.9	-21-47-51.3	18.6554	19.6680	2.8485	5.97	3.75	1.000	-175.16	
27 JUL 1994	9560.50	19 43 49.4	-21-49-57.4	18.6673	19.6688	5.3692	5.97	3.75	1.000	-170.21	
1 AUG 1994	9565.50	19 42 59.8	-21-51-59.2	18.6684	19.6696	7.8649	5.98	3.75	1.000	-165.24	
6 AUG 1994	9570.50	19 42 11.8	-21-53-55.7	18.7127	19.6704	10.3148	5.98	3.74	1.000	-160.26	
11 AUG 1994	9575.50	19 41 25.7	-21-55-45.9	18.7459	19.6712	12.6892	5.98	3.74	1.000	-155.29	
16 AUG 1994	9580.50	19 40 42.2	-21-57-28.4	18.7859	19.6720	14.9558	5.99	3.73	1.000	-150.32	
21 AUG 1994	9585.50	19 40 1.6	-21-59-2.6	18.8322	19.6728	17.1009	5.99	3.72	1.000	-145.35	
26 AUG 1994	9590.50	19 39 24.4	-22 0-27.8	18.8845	19.6736	19.1268	6.00	3.71	1.000	-140.39	
31 AUG 1994	9595.50	19 38 50.9	-22 1-42.9	18.9425	19.6743	21.0243	6.01	3.70	1.000	-135.43	
5 SEP 1994	9600.50	19 38 21.4	-22 2-47.7	19.0058	19.6751	22.7707	6.01	3.69	1.000	-130.47	
10 SEP 1994	9605.50	19 37 56.5	-22 3-41.2	19.0739	19.6759	24.3394	6.02	3.67	1.000	-125.52	
15 SEP 1994	9610.50	19 37 36.2	-22 4-23.1	19.1462	19.6767	26.7131	6.03	3.66	1.000	-120.58	
20 SEP 1994	9615.50	19 37 20.9	-22 4-53.3	19.2222	19.6775	28.8957	6.04	3.64	0.999	-115.64	
25 SEP 1994	9620.50	19 37 10.7	-22 5-11.2	19.3014	19.6783	27.8938	6.05	3.63	0.999	-110.71	
30 SEP 1994	9625.50	19 37 5.7	-22 5-18.8	19.3831	19.6791	28.6983	6.06	3.61	0.999	-105.79	
5 OCT 1994	9630.50	19 37 0.1	-22 5-10.0	19.4689	19.6799	29.2903	6.07	3.60	0.999	-100.87	
10 OCT 1994	9635.50	19 37 12.0	-22 4-50.2	19.5521	19.6807	29.6550	6.08	3.58	0.999	-95.96	
15 OCT 1994	9640.50	19 37 23.4	-22 4-18.0	19.6380	19.6815	29.7959	6.09	3.57	0.999	-91.05	
20 OCT 1994	9645.50	19 37 40.1	-22 3-33.2	19.7239	19.6822	29.7293	6.10	3.55	0.999	-86.16	
25 OCT 1994	9650.50	19 38 2.1	-22 2-35.9	19.8095	19.6830	29.4632	6.10	3.54	0.999	-81.27	
30 OCT 1994	9655.50	19 38 29.4	-22 1-26.5	19.8939	19.6838	28.9914	6.11	3.52	0.999	-76.39	
4 NOV 1994	9660.50	19 39 1.8	-22 0-4.8	19.9767	19.6846	28.3021	6.12	3.51	0.999	-71.51	
9 NOV 1994	9665.50	19 39 39.2	-21-58-31.2	20.0572	19.6854	27.3985	6.13	3.49	0.999	-66.64	
14 NOV 1994	9670.50	19 40 21.3	-21-56-46.4	20.1347	19.6862	26.3020	6.14	3.48	1.000	-61.78	
19 NOV 1994	9675.50	19 41 7.8	-21-54-50.2	20.2089	19.6869	25.0327	6.15	3.47	1.000	-56.92	
24 NOV 1994	9680.50	19 41 58.6	-21-52-43.6	20.2792	19.6877	23.5994	6.16	3.45	1.000	-52.08	
29 NOV 1994	9685.50	19 42 53.3	-21-50-26.8	20.3450	19.6885	21.9987	6.16	3.44	1.000	-47.23	
4 DEC 1994	9690.50	19 43 51.7	-21-48 0.0	20.4061	19.6893	20.2300	6.17	3.43	1.000	-42.39	
9 DEC 1994	9695.50	19 44 53.4	-21-45-24.5	20.4617	19.6901	18.3151	6.18	3.42	1.000	-37.56	
14 DEC 1994	9700.50	19 45 57.9	-21-42-40.5	20.5117	19.6908	16.2833	6.18	3.41	1.000	-32.73	
19 DEC 1994	9705.50	19 47 5.2	-21-39-48.7	20.5557	19.6916	14.1534	6.19	3.41	1.000	-27.91	
24 DEC 1994	9710.50	19 48 14.6	-21-36-50.3	20.5934	19.6924	11.9334	6.19	3.40	1.000	-23.09	
29 DEC 1994	9715.50	19 49 25.9	-21-33-45.6	20.6245	19.6932	9.6229	6.19	3.40	1.000	-18.28	

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1995	9720.50	19 50 38.7	-21-30-35.6	20.6489	19.6940	7.2350	6.20	3.39	1.000	-13.47	
8 JAN 1995	9725.50	19 51 52.5	-21-27-21.5	20.6663	19.6947	4.8034	6.20	3.39	1.000	-8.67	
13 JAN 1995	9730.50	19 53 7.0	-21-24-4.0	20.6768	19.6955	2.3555	6.20	3.39	1.000	-3.89	
18 JAN 1995	9735.50	19 54 21.7	-21-20-44.4	20.6799	19.6963	-0.0953	6.20	3.39	1.000	1.06	
23 JAN 1995	9740.50	19 55 36.4	-21-17-23.6	20.6761	19.6971	-2.5436	6.20	3.39	1.000	5.76	
28 JAN 1995	9745.50	19 56 50.5	-21-14-2.4	20.6852	19.6978	-4.9854	6.20	3.39	1.000	10.54	
2 FEB 1995	9750.50	19 58 3.7	-21-10-42.5	20.6473	19.6986	-7.3957	6.20	3.39	1.000	15.32	
7 FEB 1995	9755.50	19 59 15.6	-21-7-24.8	20.6225	19.6994	-9.7401	6.19	3.40	1.000	20.11	
12 FEB 1995	9760.50	20 0 25.9	-21-4-10.4	20.5911	19.7001	-12.0006	6.19	3.40	1.000	24.89	
17 FEB 1995	9765.50	20 1 34.1	-21-1-0.7	20.5533	19.7009	-14.1709	6.19	3.41	1.000	29.67	
22 FEB 1995	9770.50	20 2 39.8	-20-57-56.6	20.5094	19.7017	-16.2498	6.18	3.42	1.000	34.45	
27 FEB 1995	9775.50	20 3 43.0	-20-54-59.3	20.4596	19.7024	-18.2267	6.18	3.42	1.000	39.23	
4 MAR 1995	9780.50	20 4 42.9	-20-52-10.2	20.4042	19.7032	-20.0720	6.17	3.43	1.000	44.01	
9 MAR 1995	9785.50	20 5 39.5	-20-49-30.1	20.3438	19.7040	-21.7608	6.16	3.44	1.000	48.79	
14 MAR 1995	9790.50	20 6 32.5	-20-47-0.4	20.2787	19.7048	-23.2874	6.16	3.45	1.000	53.58	
19 MAR 1995	9795.50	20 7 21.4	-20-44-42.0	20.2094	19.7055	-24.6542	6.15	3.47	1.000	58.36	
24 MAR 1995	9800.50	20 8 6.2	-20-42-35.5	20.1365	19.7063	-25.8615	6.14	3.48	0.999	63.15	
29 MAR 1995	9805.50	20 8 46.6	-20-40-42.3	20.0602	19.7071	-26.8932	6.13	3.49	0.999	67.94	
3 APR 1995	9810.50	20 9 22.3	-20-39-2.9	19.9813	19.7078	-27.7248	6.13	3.51	0.999	72.73	
8 APR 1995	9815.50	20 9 53.2	-20-37-38.1	19.9003	19.7086	-28.3463	6.12	3.52	0.999	77.54	
13 APR 1995	9820.50	20 10 19.1	-20-36-28.6	19.8178	19.7093	-28.7646	6.11	3.53	0.999	82.34	
18 APR 1995	9825.50	20 10 40.0	-20-35-34.4	19.7344	19.7101	-28.9899	6.10	3.55	0.999	87.15	
23 APR 1995	9830.50	20 10 55.7	-20-34-56.2	19.6506	19.7109	-29.0203	6.09	3.56	0.999	91.97	
28 APR 1995	9835.50	20 11 6.2	-20-34-34.3	19.5670	19.7116	-28.8398	6.08	3.58	0.999	96.80	
3 MAY 1995	9840.50	20 11 11.4	-20-34-28.5	19.4842	19.7124	-28.4373	6.07	3.59	0.999	101.64	
8 MAY 1995	9845.50	20 11 11.4	-20-34-39.0	19.4029	19.7131	-27.8187	6.06	3.61	0.999	106.48	
13 MAY 1995	9850.50	20 11 6.1	-20-35-5.4	19.3237	19.7139	-27.0029	6.05	3.62	0.999	111.33	
18 MAY 1995	9855.50	20 10 55.9	-20-35-46.9	19.2472	19.7147	-26.0038	6.05	3.64	0.999	116.20	
23 MAY 1995	9860.50	20 10 40.7	-20-36-43.7	19.1737	19.7154	-24.8170	6.04	3.65	1.000	121.07	
28 MAY 1995	9865.50	20 10 20.8	-20-37-54.7	19.1040	19.7162	-23.4349	6.03	3.67	1.000	125.95	
2 JUN 1995	9870.50	20 9 56.2	-20-39-19.2	19.0386	19.7169	-21.8637	6.02	3.68	1.000	130.85	
7 JUN 1995	9875.50	20 9 27.4	-20-40-56.3	18.9779	19.7177	-20.1239	6.02	3.69	1.000	135.75	
12 JUN 1995	9880.50	20 8 54.5	-20-42-44.5	18.9225	19.7184	-18.2435	6.01	3.70	1.000	140.68	
17 JUN 1995	9885.50	20 8 18.1	-20-44-42.9	18.8727	19.7192	-16.2347	6.00	3.71	1.000	145.58	
22 JUN 1995	9890.50	20 7 38.3	-20-46-50.3	18.8289	19.7200	-14.0945	6.00	3.72	1.000	150.51	
27 JUN 1995	9895.50	20 6 55.6	-20-49-5.0	18.7914	19.7207	-11.8301	5.99	3.73	1.000	155.45	
2 JUL 1995	9900.50	20 6 10.4	-20-51-25.9	18.7608	19.7215	-9.4630	5.99	3.73	1.000	160.40	
7 JUL 1995	9905.50	20 5 23.1	-20-53-51.1	18.7368	19.7222	-7.0244	5.99	3.74	1.000	165.35	
12 JUL 1995	9910.50	20 4 34.4	-20-56-19.0	18.7201	19.7230	-4.5435	5.99	3.74	1.000	170.31	
17 JUL 1995	9915.50	20 3 44.7	-20-58-48.5	18.7106	19.7237	-2.0269	5.99	3.74	1.000	175.25	

GEOCENTRIC EPHEMERIS FOR URANUS

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	20 2 54.3	-21 -1-17.7	18.7084	19.7245	0.5224	5.99	3.74	1.000	-179.37	
27 JUL 1995	9925.50	20 2 4.0	-21 -3-45.1	18.7136	19.7252	3.0837	5.99	3.74	1.000	-174.73	
1 AUG 1995	9930.50	20 1 14.1	-21 -6 -9.5	18.7262	19.7260	5.6271	5.99	3.74	1.000	-169.77	
6 AUG 1995	9935.50	20 0 25.3	-21 -8-29.0	18.7461	19.7267	8.1194	5.99	3.74	1.000	-164.80	
11 AUG 1995	9940.50	19 59 38.0	-21-10-42.4	18.7730	19.7274	10.5409	5.99	3.73	1.000	-159.82	
16 AUG 1995	9945.50	19 58 52.7	-21-12-48.6	18.8069	19.7282	12.8919	6.00	3.72	1.000	-154.84	
21 AUG 1995	9950.50	19 58 9.9	-21-14-46.3	18.8474	19.7289	15.1626	6.00	3.72	1.000	-149.87	
26 AUG 1995	9955.50	19 57 30.1	-21-16-34.6	18.8944	19.7297	17.3267	6.01	3.71	1.000	-144.89	
31 AUG 1995	9960.50	19 56 53.5	-21-18-12.2	18.9474	19.7304	19.3552	6.01	3.70	1.000	-139.92	
5 SEP 1995	9965.50	19 56 20.8	-21-19-38.2	19.0060	19.7312	21.2248	6.02	3.69	1.000	-134.95	
10 SEP 1995	9970.50	19 55 52.2	-21-20-52.2	19.0698	19.7319	22.9327	6.03	3.67	1.000	-129.99	
15 SEP 1995	9975.50	19 55 27.9	-21-21-53.2	19.1383	19.7327	24.4832	6.04	3.66	1.000	-125.03	
20 SEP 1995	9980.50	19 55 8.3	-21-22-41.0	19.2110	19.7334	26.8639	6.04	3.65	1.000	-120.07	
25 SEP 1995	9985.50	19 54 53.6	-21-23-15.0	19.2875	19.7341	27.0513	6.05	3.63	0.999	-115.12	
30 SEP 1995	9990.50	19 54 44.0	-21-23-34.6	19.3671	19.7349	28.0259	6.06	3.62	0.999	-110.18	
5 OCT 1995	9995.50	19 54 39.6	-21-23-39.8	19.4491	19.7356	28.7838	6.07	3.60	0.999	-105.24	
10 OCT 1995	10000.50	19 54 40.6	-21-23-30.4	19.5331	19.7363	29.3365	6.08	3.59	0.999	-100.32	
15 OCT 1995	10005.50	19 54 46.9	-21-23 -6.2	19.6184	19.7371	29.6898	6.09	3.57	0.999	-95.40	
20 OCT 1995	10010.50	19 54 58.6	-21-22-27.6	19.7044	19.7378	29.8329	6.10	3.55	0.999	-90.48	
25 OCT 1995	10015.50	19 55 15.6	-21-21-34.2	19.7905	19.7386	29.7507	6.11	3.54	0.999	-85.58	
30 OCT 1995	10020.50	19 55 38.0	-21-20-26.1	19.8760	19.7393	29.4397	6.12	3.52	0.999	-80.67	
4 NOV 1995	10025.50	19 56 5.6	-21-19 -4.1	19.9603	19.7400	28.9158	6.13	3.51	0.999	-75.78	
9 NOV 1995	10030.50	19 56 38.1	-21-17-27.9	20.0428	19.7408	28.1974	6.14	3.49	0.999	-70.90	
14 NOV 1995	10035.50	19 57 15.5	-21-15-38.3	20.1230	19.7415	27.2900	6.15	3.48	0.999	-66.02	
19 NOV 1995	10040.50	19 57 57.5	-21-13-35.6	20.2002	19.7422	26.1879	6.15	3.47	1.000	-61.15	
24 NOV 1995	10045.50	19 58 44.0	-21-11-19.9	20.2740	19.7430	24.8865	6.16	3.45	1.000	-56.28	
29 NOV 1995	10050.50	19 59 34.6	-21 -8-52.2	20.3438	19.7437	23.4018	6.17	3.44	1.000	-51.42	
4 DEC 1995	10055.50	20 0 29.1	-21 -6-13.1	20.4090	19.7444	21.7618	6.18	3.43	1.000	-46.57	
9 DEC 1995	10060.50	20 1 27.1	-21 -3-23.0	20.4693	19.7451	19.9840	6.18	3.42	1.000	-41.73	
14 DEC 1995	10065.50	20 2 28.3	-21 0-23.1	20.5243	19.7459	18.0745	6.19	3.41	1.000	-36.89	
19 DEC 1995	10070.50	20 3 32.4	-20-57-13.8	20.5736	19.7466	16.0323	6.19	3.40	1.000	-32.06	
24 DEC 1995	10075.50	20 4 39.0	-20-53-55.9	20.6168	19.7473	13.8668	6.20	3.40	1.000	-27.23	
29 DEC 1995	10080.50	20 5 47.8	-20-50-30.7	20.6536	19.7480	11.6081	6.20	3.39	1.000	-22.41	

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1986	6435.50	18 16 10.3	-22-19-43.7	31.2145	30.2487	-5.5582	7.83	2.15	1.000		10.65
10 JAN 1986	6440.50	18 16 58.5	-22-19-24.5	31.1948	30.2485	-8.0408	7.82	2.15	1.000		15.55
15 JAN 1986	6445.50	18 17 45.7	-22-19-4.3	31.1681	30.2484	-10.4632	7.82	2.15	1.000		20.46
20 JAN 1986	6450.50	18 18 31.7	-22-18-42.7	31.1345	30.2483	-12.7983	7.82	2.15	1.000		25.36
25 JAN 1986	6455.50	18 19 16.3	-22-18-20.1	31.0943	30.2482	-15.0288	7.82	2.16	1.000		30.27
30 JAN 1986	6460.50	18 19 59.1	-22-17-57.0	31.0478	30.2480	-17.1584	7.81	2.16	1.000		35.18
4 FEB 1986	6465.50	18 20 40.0	-22-17-33.0	30.9953	30.2479	-19.1734	7.81	2.16	1.000		40.10
9 FEB 1986	6470.50	18 21 18.8	-22-17-8.9	30.9372	30.2478	-21.0578	7.81	2.17	1.000		45.01
14 FEB 1986	6475.50	18 21 55.0	-22-16-45.0	30.8738	30.2477	-22.7770	7.80	2.17	1.000		49.93
19 FEB 1986	6480.50	18 22 28.6	-22-16-21.1	30.8058	30.2475	-24.3164	7.80	2.18	1.000		54.85
24 FEB 1986	6485.50	18 22 59.4	-22-15-58.0	30.7336	30.2474	-25.6763	7.79	2.18	1.000		59.77
1 MAR 1986	6490.50	18 23 27.1	-22-15-35.6	30.6577	30.2473	-26.8593	7.79	2.19	1.000		64.68
6 MAR 1986	6495.50	18 23 51.8	-22-15-14.1	30.5786	30.2472	-27.8580	7.78	2.19	1.000		69.60
11 MAR 1986	6500.50	18 24 13.1	-22-14-54.3	30.4970	30.2470	-28.6497	7.77	2.20	1.000		74.52
16 MAR 1986	6505.50	18 24 30.9	-22-14-35.6	30.4134	30.2469	-29.2188	7.77	2.20	1.000		79.44
21 MAR 1986	6510.50	18 24 45.3	-22-14-18.8	30.3285	30.2468	-29.5611	7.76	2.21	1.000		84.35
26 MAR 1986	6515.50	18 24 58.2	-22-14-4.1	30.2429	30.2467	-29.6951	7.76	2.22	1.000		89.27
31 MAR 1986	6520.50	18 25 3.4	-22-13-51.1	30.1572	30.2465	-29.8280	7.75	2.22	1.000		94.18
5 APR 1986	6525.50	18 25 7.1	-22-13-40.5	30.0720	30.2464	-29.3447	7.74	2.23	1.000		99.10
10 APR 1986	6530.50	18 25 7.1	-22-13-32.1	29.9879	30.2463	-28.8379	7.74	2.23	1.000		104.02
15 APR 1986	6535.50	18 25 3.6	-22-13-25.9	29.9058	30.2461	-28.1066	7.73	2.24	1.000		108.93
20 APR 1986	6540.50	18 24 58.6	-22-13-22.3	29.8258	30.2460	-27.1679	7.73	2.25	1.000		113.85
25 APR 1986	6545.50	18 24 46.2	-22-13-20.9	29.7489	30.2459	-26.0436	7.72	2.25	1.000		118.76
30 APR 1986	6550.50	18 24 32.7	-22-13-21.6	29.6755	30.2458	-24.7406	7.72	2.26	1.000		123.67
5 MAY 1986	6555.50	18 24 15.9	-22-13-25.0	29.6062	30.2458	-23.2518	7.71	2.26	1.000		128.59
10 MAY 1986	6560.50	18 23 58.2	-22-13-30.2	29.5414	30.2455	-21.5797	7.71	2.27	1.000		133.50
15 MAY 1986	6565.50	18 23 33.9	-22-13-37.5	29.4817	30.2454	-19.7418	7.70	2.27	1.000		138.42
20 MAY 1986	6570.50	18 23 8.9	-22-13-47.0	29.4275	30.2452	-17.7665	7.70	2.28	1.000		143.33
25 MAY 1986	6575.50	18 22 41.8	-22-13-57.9	29.3792	30.2451	-15.6778	7.69	2.28	1.000		148.24
30 MAY 1986	6580.50	18 22 12.6	-22-14-10.7	29.3371	30.2450	-13.4786	7.69	2.28	1.000		153.14
4 JUN 1986	6585.50	18 21 41.7	-22-14-24.9	29.3015	30.2449	-11.1698	7.69	2.29	1.000		158.05
9 JUN 1986	6590.50	18 21 9.3	-22-14-40.2	29.2727	30.2447	-8.7693	7.69	2.29	1.000		162.95
14 JUN 1986	6595.50	18 20 35.8	-22-14-56.9	29.2509	30.2446	-6.3051	7.68	2.29	1.000		167.85
19 JUN 1986	6600.50	18 20 1.5	-22-15-14.3	29.2363	30.2445	-3.8092	7.68	2.29	1.000		172.72
24 JUN 1986	6605.50	18 19 26.7	-22-15-32.4	29.2289	30.2443	-1.2996	7.68	2.29	1.000		177.45
29 JUN 1986	6610.50	18 18 51.8	-22-15-51.5	29.2268	30.2442	1.2244	7.68	2.29	1.000		-177.17
4 JUL 1986	6615.50	18 18 17.0	-22-16-10.6	29.2360	30.2441	3.7516	7.68	2.29	1.000		-172.41
9 JUL 1986	6620.50	18 17 42.7	-22-16-30.2	29.2504	30.2439	6.2549	7.68	2.29	1.000		-167.54
14 JUL 1986	6625.50	18 17 9.1	-22-16-50.2	29.2720	30.2438	8.7037	7.69	2.29	1.000		-162.66
19 JUL 1986	6630.50	18 16 36.8	-22-17-9.8	29.3006	30.2437	11.0720	7.69	2.29	1.000		-157.77

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1986	6835.50	18 16	5.9	-22-17-29.7	29.3359	30.2435	13.3541	7.69	2.28	1.000	-152.88
29 JUL 1986	6840.50	18 15	36.6	-22-17-49.2	29.3777	30.2434	15.5506	7.69	2.28	1.000	-148.00
3 AUG 1986	6845.50	18 15	9.4	-22-18-8.5	29.4256	30.2433	17.6432	7.70	2.28	1.000	-143.11
8 AUG 1986	6850.50	18 14	44.4	-22-18-27.6	29.4794	30.2432	19.6040	7.70	2.27	1.000	-138.23
13 AUG 1986	6855.50	18 14	21.9	-22-18-46.1	29.5387	30.2430	21.4081	7.71	2.27	1.000	-133.35
18 AUG 1986	6860.50	18 14	2.2	-22-19-4.1	29.6029	30.2429	23.0443	7.71	2.26	1.000	-128.47
23 AUG 1986	6865.50	18 13	45.4	-22-19-21.7	29.6716	30.2428	24.5184	7.71	2.26	1.000	-123.59
28 AUG 1986	6870.50	18 13	31.6	-22-19-38.4	29.7444	30.2426	25.8289	7.72	2.25	1.000	-118.72
2 SEP 1986	6875.50	18 13	21.0	-22-19-54.6	29.8206	30.2425	26.9683	7.73	2.25	1.000	-113.84
7 SEP 1986	6880.50	18 13	13.8	-22-20-10.0	29.8998	30.2424	27.8785	7.73	2.24	1.000	-108.97
12 SEP 1986	6885.50	18 13	10.1	-22-20-24.2	29.9814	30.2422	28.5844	7.74	2.24	1.000	-104.10
17 SEP 1986	6890.50	18 13	9.8	-22-20-37.8	30.0647	30.2421	29.0807	7.74	2.23	1.000	-99.23
22 SEP 1986	6895.50	18 13	13.1	-22-20-50.2	30.1492	30.2420	29.3790	7.75	2.22	1.000	-94.36
27 SEP 1986	6900.50	18 13	20.0	-22-21-1.3	30.2342	30.2418	29.4762	7.76	2.22	1.000	-89.49
2 OCT 1986	6905.50	18 13	30.5	-22-21-11.4	30.3192	30.2417	29.3571	7.76	2.21	1.000	-84.62
7 OCT 1986	6910.50	18 13	44.5	-22-21-19.9	30.4036	30.2416	29.0110	7.77	2.20	1.000	-79.75
12 OCT 1986	6915.50	18 14	2.0	-22-21-26.9	30.4866	30.2414	28.4453	7.77	2.20	1.000	-74.88
17 OCT 1986	6920.50	18 14	22.9	-22-21-32.5	30.5676	30.2413	27.6804	7.78	2.19	1.000	-70.00
22 OCT 1986	6925.50	18 14	47.0	-22-21-38.1	30.6462	30.2412	26.7280	7.78	2.19	1.000	-65.13
27 OCT 1986	6930.50	18 15	14.3	-22-21-38.1	30.7218	30.2410	25.5855	7.79	2.18	1.000	-60.26
1 NOV 1986	6935.50	18 15	44.6	-22-21-38.1	30.7938	30.2409	24.2486	7.80	2.18	1.000	-55.38
6 NOV 1986	6940.50	18 16	17.8	-22-21-35.8	30.8617	30.2408	22.7189	7.80	2.17	1.000	-50.50
11 NOV 1986	6945.50	18 16	53.7	-22-21-31.8	30.9249	30.2406	21.0229	7.80	2.17	1.000	-45.62
16 NOV 1986	6950.50	18 17	32.0	-22-21-25.4	30.9830	30.2405	19.1858	7.81	2.16	1.000	-40.74
21 NOV 1986	6955.50	18 18	12.5	-22-21-16.7	31.0358	30.2404	17.2170	7.81	2.16	1.000	-35.85
26 NOV 1986	6960.50	18 18	55.0	-22-21-6.0	31.0823	30.2402	15.1191	7.82	2.16	1.000	-30.97
1 DEC 1986	6965.50	18 19	39.2	-22-20-52.6	31.1228	30.2401	12.8946	7.82	2.15	1.000	-26.08
6 DEC 1986	6970.50	18 20	25.1	-22-20-37.1	31.1567	30.2400	10.5647	7.82	2.15	1.000	-21.18
11 DEC 1986	6975.50	18 21	12.0	-22-20-19.5	31.1837	30.2398	8.1653	7.82	2.15	1.000	-16.29
16 DEC 1986	6980.50	18 21	60.0	-22-19-59.3	31.2038	30.2397	5.7174	7.82	2.15	1.000	-11.41
21 DEC 1986	6985.50	18 22	48.6	-22-19-37.4	31.2167	30.2396	3.2290	7.82	2.15	1.000	-6.54
26 DEC 1986	6990.50	18 23	37.5	-22-19-13.3	31.2224	30.2394	0.7062	7.83	2.15	1.000	-1.86
31 DEC 1986	6995.50	18 24	26.7	-22-18-47.2	31.2208	30.2393	-1.8383	7.83	2.15	1.000	3.50

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1987	6800.50	18 25	15.6	-22-18-19.8	31.2118	30.2392	-4.3707	7.82	2.15	1.000	8.32
10 JAN 1987	6805.50	18 26	4.0	-22-17-50.6	31.1968	30.2390	-6.8577	7.82	2.15	1.000	13.20
15 JAN 1987	6810.50	18 26	51.6	-22-17-20.2	31.1722	30.2389	-9.2873	7.82	2.15	1.000	18.10
20 JAN 1987	6815.50	18 27	38.2	-22-16-49.0	31.1420	30.2388	-11.6539	7.82	2.15	1.000	23.01
25 JAN 1987	6820.50	18 28	23.4	-22-16-16.7	31.1050	30.2386	-13.9494	7.82	2.15	1.000	27.91
30 JAN 1987	6825.50	18 29	7.2	-22-15-44.2	31.0615	30.2385	-16.1523	7.81	2.16	1.000	32.83
4 FEB 1987	6830.50	18 29	49.0	-22-15-11.5	31.0118	30.2383	-18.2278	7.81	2.16	1.000	37.74
9 FEB 1987	6835.50	18 30	28.7	-22-14-38.7	30.9584	30.2382	-20.1558	7.81	2.16	1.000	42.65
14 FEB 1987	6840.50	18 31	6.2	-22-14-6.7	30.8958	30.2381	-21.9348	7.80	2.17	1.000	47.58
19 FEB 1987	6845.50	18 31	41.0	-22-13-35.4	30.8298	30.2379	-23.5638	7.80	2.17	1.000	52.47
24 FEB 1987	6850.50	18 32	13.2	-22-13-4.8	30.7598	30.2378	-25.0330	7.79	2.18	1.000	57.39
1 MAR 1987	6855.50	18 32	42.4	-22-12-36.1	30.6854	30.2377	-26.3182	7.79	2.18	1.000	62.30
6 MAR 1987	6860.50	18 33	8.5	-22-12-8.7	30.6078	30.2375	-27.3959	7.78	2.19	1.000	67.21
11 MAR 1987	6865.50	18 33	31.4	-22-11-43.4	30.5274	30.2374	-28.2636	7.78	2.20	1.000	72.13
16 MAR 1987	6870.50	18 33	50.9	-22-11-20.4	30.4448	30.2373	-28.9303	7.77	2.20	1.000	77.04
21 MAR 1987	6875.50	18 34	7.0	-22-10-59.5	30.3605	30.2371	-29.3992	7.76	2.21	1.000	81.95
26 MAR 1987	6880.50	18 34	19.6	-22-10-41.5	30.2752	30.2370	-29.6594	7.76	2.21	1.000	86.86
31 MAR 1987	6885.50	18 34	28.6	-22-10-26.3	30.1894	30.2369	-29.6928	7.75	2.22	1.000	91.77
5 APR 1987	6890.50	18 34	34.0	-22-10-13.7	30.1039	30.2367	-29.4950	7.75	2.23	1.000	96.68
10 APR 1987	6895.50	18 34	35.8	-22-10-4.5	30.0193	30.2366	-29.0794	7.74	2.23	1.000	101.59
15 APR 1987	6900.50	18 34	34.0	-22-9-58.3	29.9362	30.2364	-28.4634	7.73	2.24	1.000	106.50
20 APR 1987	6905.50	18 34	28.7	-22-9-55.0	29.8551	30.2363	-27.6518	7.73	2.24	1.000	111.41
25 APR 1987	6910.50	18 34	20.1	-22-9-55.2	29.7767	30.2362	-26.6349	7.72	2.25	1.000	116.32
30 APR 1987	6915.50	18 34	8.0	-22-9-58.1	29.7015	30.2360	-25.4093	7.72	2.26	1.000	121.23
5 MAY 1987	6920.50	18 33	52.8	-22-10-4.1	29.6301	30.2359	-23.9895	7.71	2.26	1.000	126.14
10 MAY 1987	6925.50	18 33	34.6	-22-10-13.2	29.5631	30.2358	-22.4001	7.71	2.27	1.000	131.05
15 MAY 1987	6930.50	18 33	13.6	-22-10-24.6	29.5009	30.2358	-20.6824	7.70	2.27	1.000	136.96
20 MAY 1987	6935.50	18 32	49.9	-22-10-38.9	29.4439	30.2355	-18.7796	7.70	2.28	1.000	140.86
25 MAY 1987	6940.50	18 32	23.9	-22-10-55.5	29.3925	30.2354	-16.7482	7.69	2.28	1.000	145.77
30 MAY 1987	6945.50	18 31	55.7	-22-11-14.0	29.3473	30.2352	-14.5828	7.69	2.28	1.000	150.67
4 JUN 1987	6950.50	18 31	25.6	-22-11-34.8	29.3084	30.2351	-12.3104	7.69	2.29	1.000	155.58
9 JUN 1987	6955.50	18 30	53.9	-22-11-57.1	29.2763	30.2349	-9.9604	7.69	2.29	1.000	160.48
14 JUN 1987	6960.50	18 30	21.0	-22-12-20.7	29.2510	30.2348	-7.5517	7.68	2.29	1.000	165.37
19 JUN 1987	6965.50	18 29	47.1	-22-12-45.8	29.2327	30.2347	-5.0845	7.68	2.29	1.000	170.26
24 JUN 1987	6970.50	18 29	12.6	-22-13-11.6	29.2216	30.2345	-2.5662	7.68	2.29	1.000	175.11
29 JUN 1987	6975.50	18 28	37.7	-22-13-38.2	29.2179	30.2344	-0.0246	7.68	2.29	1.000	-178.94
4 JUL 1987	6980.50	18 28	2.7	-22-14-5.4	29.2215	30.2343	2.5095	7.68	2.29	1.000	-174.86
9 JUL 1987	6985.50	18 27	28.2	-22-14-32.6	29.2324	30.2341	5.0095	7.68	2.29	1.000	-170.02
14 JUL 1987	6990.50	18 26	54.3	-22-15-0.1	29.2504	30.2340	7.4657	7.68	2.29	1.000	-165.14
19 JUL 1987	6995.50	18 26	21.3	-22-15-27.3	29.2754	30.2339	9.8787	7.68	2.29	1.000	-160.25

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
24 JUL 1987	7000.50	18 25	49.6	-22-15-54.0	29.3074	30.2337	12.2305	7.69	2.29	1.000	-155.36
29 JUL 1987	7005.50	18 25	19.5	-22-16-20.5	29.3460	30.2336	14.4898	7.69	2.28	1.000	-150.47
3 AUG 1987	7010.50	18 24	51.2	-22-16-46.2	29.3909	30.2334	16.6302	7.69	2.28	1.000	-145.58
8 AUG 1987	7015.50	18 24	25.2	-22-17-10.9	29.4419	30.2333	18.6366	7.70	2.28	1.000	-140.70
13 AUG 1987	7020.50	18 24	1.4	-22-17-35.0	29.4985	30.2332	20.6104	7.70	2.27	1.000	-135.81
18 AUG 1987	7025.50	18 23	40.3	-22-17-57.6	29.5602	30.2330	22.2497	7.71	2.27	1.000	-130.93
23 AUG 1987	7030.50	18 23	21.9	-22-18-19.2	29.6268	30.2329	23.8320	7.71	2.26	1.000	-126.05
28 AUG 1987	7035.50	18 23	6.6	-22-18-39.6	29.6977	30.2328	25.2314	7.72	2.26	1.000	-121.16
2 SEP 1987	7040.50	18 22	54.4	-22-18-58.2	29.7723	30.2326	26.4334	7.72	2.25	1.000	-116.28
7 SEP 1987	7045.50	18 22	45.6	-22-19-15.6	29.8502	30.2325	27.4391	7.73	2.24	1.000	-111.41
12 SEP 1987	7050.50	18 22	40.1	-22-19-31.3	29.9306	30.2323	28.2574	7.73	2.24	1.000	-106.53
17 SEP 1987	7055.50	18 22	38.1	-22-19-45.1	30.0132	30.2322	28.8831	7.74	2.23	1.000	-101.66
22 SEP 1987	7060.50	18 22	39.7	-22-19-57.3	30.0972	30.2321	29.2970	7.74	2.23	1.000	-96.78
27 SEP 1987	7065.50	18 22	44.8	-22-20-7.4	30.1822	30.2319	29.4844	7.75	2.22	1.000	-91.90
2 OCT 1987	7070.50	18 22	53.5	-22-20-15.4	30.2673	30.2318	29.4479	7.76	2.21	1.000	-87.03
7 OCT 1987	7075.50	18 23	5.8	-22-20-21.6	30.3520	30.2317	29.2034	7.76	2.21	1.000	-82.15
12 OCT 1987	7080.50	18 23	21.6	-22-20-25.1	30.4358	30.2315	28.7611	7.77	2.20	1.000	-77.27
17 OCT 1987	7085.50	18 23	40.8	-22-20-26.6	30.5180	30.2314	28.1157	7.78	2.20	1.000	-72.40
22 OCT 1987	7090.50	18 24	3.3	-22-20-25.7	30.5980	30.2313	27.2567	7.78	2.19	1.000	-67.52
27 OCT 1987	7095.50	18 24	29.1	-22-20-22.0	30.6762	30.2311	26.1845	7.79	2.18	1.000	-62.63
1 NOV 1987	7100.50	18 24	58.1	-22-20-16.1	30.7490	30.2310	24.9195	7.79	2.18	1.000	-57.75
6 NOV 1987	7105.50	18 25	29.9	-22-20-7.4	30.8189	30.2308	23.4855	7.80	2.17	1.000	-52.87
11 NOV 1987	7110.50	18 26	4.4	-22-19-55.9	30.8845	30.2307	21.8902	7.80	2.17	1.000	-47.99
16 NOV 1987	7115.50	18 26	41.5	-22-19-42.1	30.9452	30.2306	20.1325	7.81	2.17	1.000	-43.10
21 NOV 1987	7120.50	18 27	21.0	-22-19-25.2	31.0006	30.2304	18.2133	7.81	2.16	1.000	-38.21
26 NOV 1987	7125.50	18 28	2.6	-22-19-5.6	31.0503	30.2303	16.1493	7.81	2.16	1.000	-33.32
1 DEC 1987	7130.50	18 28	46.0	-22-18-43.6	31.0938	30.2302	13.9739	7.82	2.16	1.000	-28.42
6 DEC 1987	7135.50	18 29	31.0	-22-18-18.6	31.1309	30.2300	11.7092	7.82	2.15	1.000	-23.53
11 DEC 1987	7140.50	18 30	17.5	-22-17-51.4	31.1613	30.2299	9.3609	7.82	2.15	1.000	-18.64
16 DEC 1987	7145.50	18 31	4.9	-22-17-21.6	31.1849	30.2297	6.9342	7.82	2.15	1.000	-13.75
21 DEC 1987	7150.50	18 31	53.2	-22-16-49.4	31.2013	30.2296	4.4411	7.82	2.15	1.000	-8.86
26 DEC 1987	7155.50	18 32	42.1	-22-16-15.4	31.2105	30.2295	1.9119	7.82	2.15	1.000	-4.02
31 DEC 1987	7160.50	18 33	31.1	-22-15-39.1	31.2123	30.2293	-0.6178	7.82	2.15	1.000	1.39

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
5 JAN 1988	7185.50	18 34 20.1	-22-15	-1.2	31.2069	30.2292	-3.1344	7.82	2.15	1.000	5.99
10 JAN 1988	7170.50	18 35 8.7	-22-14-22.1		31.1943	30.2291	-5.6333	7.82	2.15	1.000	10.88
15 JAN 1988	7175.50	18 35 58.7	-22-13-41.5		31.1744	30.2289	-8.1042	7.82	2.15	1.000	15.75
20 JAN 1988	7180.50	18 36 43.8	-22-13 -0.1		31.1475	30.2288	-10.5264	7.82	2.15	1.000	20.66
25 JAN 1988	7185.50	18 37 29.7	-22-12-18.3		31.1137	30.2287	-12.8643	7.82	2.15	1.000	25.58
30 JAN 1988	7190.50	18 38 14.1	-22-11-36.0		31.0733	30.2285	-15.0929	7.81	2.16	1.000	30.47
4 FEB 1988	7195.50	18 38 58.8	-22-10-54.1		31.0266	30.2284	-17.2091	7.81	2.16	1.000	35.38
9 FEB 1988	7200.50	18 39 37.5	-22-10-12.6		30.9740	30.2282	-19.2097	7.81	2.16	1.000	40.28
14 FEB 1988	7205.50	18 40 16.0	-22 -9-31.8		30.9158	30.2281	-21.0821	7.80	2.17	1.000	45.19
19 FEB 1988	7210.50	18 40 52.1	-22 -8-52.4		30.8524	30.2280	-22.8014	7.80	2.17	1.000	50.10
24 FEB 1988	7215.50	18 41 25.5	-22 -8-14.4		30.7843	30.2278	-24.3396	7.79	2.18	1.000	55.01
29 FEB 1988	7220.50	18 41 58.1	-22 -7-38.3		30.7120	30.2277	-26.8890	7.79	2.18	1.000	59.92
5 MAR 1988	7225.50	18 42 23.7	-22 -7 -4.7		30.6361	30.2276	-29.6560	7.78	2.19	1.000	64.82
10 MAR 1988	7230.50	18 42 48.1	-22 -6-33.2		30.5571	30.2274	-27.8401	7.78	2.19	1.000	69.73
15 MAR 1988	7235.50	18 43 9.3	-22 -6 -4.8		30.4755	30.2273	-28.6280	7.77	2.20	1.000	74.64
20 MAR 1988	7240.50	18 43 27.0	-22 -5-39.6		30.3920	30.2272	-29.1983	7.77	2.20	1.000	79.54
25 MAR 1988	7245.50	18 43 41.3	-22 -5-17.4		30.3071	30.2270	-29.5498	7.78	2.21	1.000	84.45
30 MAR 1988	7250.50	18 43 52.0	-22 -4-59.1		30.2216	30.2269	-29.6843	7.75	2.22	1.000	89.35
4 APR 1988	7255.50	18 43 59.1	-22 -4-44.3		30.1360	30.2267	-29.5830	7.76	2.22	1.000	94.26
9 APR 1988	7260.50	18 44 2.7	-22 -4-33.1		30.0509	30.2266	-29.2986	7.74	2.23	1.000	99.16
14 APR 1988	7265.50	18 44 2.7	-22 -4-26.1		29.9670	30.2265	-28.7985	7.74	2.24	1.000	104.06
19 APR 1988	7270.50	18 43 59.2	-22 -4-22.7		29.8848	30.2263	-28.0742	7.73	2.24	1.000	108.97
24 APR 1988	7275.50	18 43 52.2	-22 -4-23.3		29.8050	30.2262	-27.1357	7.72	2.25	1.000	113.87
29 APR 1988	7280.50	18 43 41.8	-22 -4-28.0		29.7283	30.2261	-26.0041	7.72	2.25	1.000	118.78
4 MAY 1988	7285.50	18 43 28.2	-22 -4-36.0		29.6550	30.2259	-24.6972	7.71	2.26	1.000	123.68
9 MAY 1988	7290.50	18 43 11.5	-22 -4-47.8		29.5858	30.2258	-23.2173	7.71	2.26	1.000	128.58
14 MAY 1988	7295.50	18 42 51.9	-22 -5 -3.1		29.5211	30.2257	-21.5572	7.70	2.27	1.000	133.48
19 MAY 1988	7300.50	18 42 29.5	-22 -5-21.4		29.4614	30.2255	-19.7283	7.70	2.27	1.000	138.39
24 MAY 1988	7305.50	18 42 4.7	-22 -5-43.0		29.4073	30.2254	-17.7503	7.69	2.28	1.000	143.29
29 MAY 1988	7310.50	18 41 37.5	-22 -6 -7.2		29.3590	30.2253	-15.6556	7.69	2.28	1.000	148.20
3 JUN 1988	7315.50	18 41 8.4	-22 -6-33.6		29.3170	30.2251	-13.4602	7.69	2.29	1.000	153.10
8 JUN 1988	7320.50	18 40 37.6	-22 -7 -2.6		29.2814	30.2250	-11.1647	7.68	2.29	1.000	158.00
13 JUN 1988	7325.50	18 40 5.3	-22 -7-33.1		29.2526	30.2248	-8.7725	7.68	2.29	1.000	162.89
18 JUN 1988	7330.50	18 39 31.9	-22 -8 -5.3		29.2308	30.2247	-6.3096	7.68	2.29	1.000	167.79
23 JUN 1988	7335.50	18 38 57.6	-22 -8-38.8		29.2162	30.2246	-3.8077	7.68	2.29	1.000	172.67
28 JUN 1988	7340.50	18 38 22.9	-22 -9-12.8		29.2088	30.2244	-1.2920	7.68	2.29	1.000	177.44
3 JUL 1988	7345.50	18 37 48.0	-22 -9-47.8		29.2087	30.2243	1.2249	7.68	2.29	1.000	-177.28
8 JUL 1988	7350.50	18 37 13.3	-22-10-22.9		29.2159	30.2242	3.7432	7.68	2.29	1.000	-172.50
13 JUL 1988	7355.50	18 36 39.0	-22-10-57.9		29.2303	30.2240	6.2472	7.68	2.29	1.000	-167.62
18 JUL 1988	7360.50	18 36 5.6	-22-11-32.9		29.2519	30.2239	8.7030	7.68	2.29	1.000	-162.73

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/s)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1988	7365.50	18 35	33.2	-22-12 -7.1	29.2805	30.2238	11.0827	7.68	2.29	1.000	-157.84
28 JUL 1988	7370.50	18 35	2.3	-22-12-40.5	29.3159	30.2238	13.3689	7.69	2.29	1.000	-152.95
2 AUG 1988	7375.50	18 34	33.1	-22-13-13.1	29.3576	30.2235	15.5587	7.69	2.28	1.000	-148.06
7 AUG 1988	7380.50	18 34	5.9	-22-13-44.1	29.4058	30.2234	17.6498	7.69	2.28	1.000	-143.17
12 AUG 1988	7385.50	18 33	41.0	-22-14-13.9	29.4595	30.2232	19.6188	7.70	2.27	1.000	-138.28
17 AUG 1988	7390.50	18 33	18.5	-22-14-42.1	29.5188	30.2231	21.4348	7.70	2.27	1.000	-133.39
22 AUG 1988	7395.50	18 32	58.7	-22-15 -8.2	29.5831	30.2230	23.0806	7.71	2.27	1.000	-128.50
27 AUG 1988	7400.50	18 32	41.9	-22-15-32.7	29.6519	30.2228	24.5531	7.71	2.26	1.000	-123.62
1 SEP 1988	7405.50	18 32	28.2	-22-15-54.9	29.7247	30.2227	25.8571	7.72	2.25	1.000	-118.73
6 SEP 1988	7410.50	18 32	17.6	-22-16-14.8	29.8011	30.2226	26.9868	7.72	2.25	1.000	-113.85
11 SEP 1988	7415.50	18 32	10.5	-22-16-32.6	29.8804	30.2224	27.9181	7.73	2.24	1.000	-108.96
16 SEP 1988	7420.50	18 32	6.7	-22-16-47.7	29.9621	30.2223	28.6329	7.73	2.24	1.000	-104.08
21 SEP 1988	7425.50	18 32	6.6	-22-17 -0.1	30.0456	30.2222	29.1289	7.74	2.23	1.000	-99.20
26 SEP 1988	7430.50	18 32	9.9	-22-17-10.1	30.1301	30.2220	29.4174	7.75	2.22	1.000	-94.32
1 OCT 1988	7435.50	18 32	16.9	-22-17-17.0	30.2153	30.2219	29.5067	7.75	2.22	1.000	-89.44
6 OCT 1988	7440.50	18 32	27.4	-22-17-21.2	30.3004	30.2218	29.3882	7.76	2.21	1.000	-84.55
11 OCT 1988	7445.50	18 32	41.4	-22-17-22.5	30.3848	30.2216	29.0473	7.76	2.21	1.000	-79.67
16 OCT 1988	7450.50	18 32	59.0	-22-17-20.4	30.4679	30.2215	28.4806	7.77	2.20	1.000	-74.78
21 OCT 1988	7455.50	18 33	20.0	-22-17-15.5	30.5491	30.2214	27.7030	7.78	2.19	1.000	-69.90
26 OCT 1988	7460.50	18 33	44.2	-22-17 -7.2	30.6277	30.2212	26.7357	7.78	2.19	1.000	-65.01
31 OCT 1988	7465.50	18 34	11.6	-22-16-55.7	30.7033	30.2211	25.5851	7.79	2.18	1.000	-60.13
5 NOV 1988	7470.50	18 34	41.9	-22-16-41.2	30.7753	30.2210	24.2460	7.79	2.18	1.000	-55.24
10 NOV 1988	7475.50	18 35	15.2	-22-16-23.1	30.8432	30.2208	22.7166	7.80	2.17	1.000	-50.35
15 NOV 1988	7480.50	18 35	51.1	-22-16 -1.8	30.9063	30.2207	21.0095	7.80	2.17	1.000	-45.45
20 NOV 1988	7485.50	18 36	29.4	-22-15-37.5	30.9644	30.2206	19.1541	7.81	2.16	1.000	-40.56
25 NOV 1988	7490.50	18 37	9.9	-22-15 -9.7	31.0168	30.2204	17.1731	7.81	2.16	1.000	-35.67
30 NOV 1988	7495.50	18 37	52.5	-22-14-39.0	31.0634	30.2203	15.0899	7.81	2.16	1.000	-30.77
5 DEC 1988	7500.50	18 38	38.7	-22-14 -5.3	31.1038	30.2202	12.8469	7.82	2.15	1.000	-25.87
10 DEC 1988	7505.50	18 39	22.5	-22-13-28.5	31.1375	30.2200	10.5155	7.82	2.15	1.000	-20.98
15 DEC 1988	7510.50	18 40	9.5	-22-12-49.3	31.1644	30.2199	8.1022	7.82	2.15	1.000	-16.08
20 DEC 1988	7515.50	18 40	57.3	-22-12 -7.4	31.1843	30.2198	5.6422	7.82	2.15	1.000	-11.18
25 DEC 1988	7520.50	18 41	45.9	-22-11-23.1	31.1970	30.2196	3.1516	7.82	2.15	1.000	-6.31
30 DEC 1988	7525.50	18 42	34.7	-22-10-37.1	31.2024	30.2195	0.6329	7.82	2.15	1.000	-1.62

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1989	7530.50	18 43	23.7	-22	-9-48.9	30.2008	30.2194	-1.9033	2.15	1.000	3.68
9 JAN 1989	7535.50	18 44	12.5	-22	-8-59.4	31.1915	30.2193	-4.4362	2.15	1.000	8.52
14 JAN 1989	7540.50	18 45	0.7	-22	-8 -8.9	31.1750	30.2191	-6.9315	2.15	1.000	13.42
19 JAN 1989	7545.50	18 45	48.2	-22	-7-17.2	31.1515	30.2190	-9.3602	2.15	1.000	18.31
24 JAN 1989	7550.50	18 46	34.6	-22	-6-25.5	31.1210	30.2189	-11.7169	2.15	1.000	23.22
29 JAN 1989	7555.50	18 47	19.7	-22	-6-33.6	31.0839	30.2187	-13.9987	2.16	1.000	28.12
3 FEB 1989	7560.50	18 48	3.2	-22	-4-41.8	31.0403	30.2186	-16.1898	2.16	1.000	33.02
8 FEB 1989	7565.50	18 48	44.8	-22	-3-51.2	30.9905	30.2185	-18.2649	2.16	1.000	37.93
13 FEB 1989	7570.50	18 49	24.3	-22	-3 -1.5	30.9349	30.2183	-20.1932	2.17	1.000	42.84
18 FEB 1989	7575.50	18 50	1.5	-22	-2-13.4	30.8740	30.2182	-21.9815	2.17	1.000	47.74
23 FEB 1989	7580.50	18 50	36.2	-22	-1-27.6	30.8082	30.2181	-23.5740	2.18	1.000	52.64
28 FEB 1989	7585.50	18 51	8.1	-22	0-43.8	30.7380	30.2179	-25.0277	2.18	1.000	57.54
5 MAR 1989	7590.50	18 51	37.1	-22	0 -2.8	30.6639	30.2178	-26.3061	2.19	1.000	62.44
10 MAR 1989	7595.50	18 52	3.1	-21	-59-25.2	30.5883	30.2177	-27.3856	2.19	1.000	67.35
15 MAR 1989	7600.50	18 52	25.8	-21	-58-50.6	30.5059	30.2176	-28.2500	2.20	1.000	72.25
20 MAR 1989	7605.50	18 52	45.1	-21	-58-20.2	30.4233	30.2174	-28.9043	2.20	1.000	77.14
25 MAR 1989	7610.50	18 53	1.0	-21	-57-53.6	30.3392	30.2173	-29.3590	2.21	1.000	82.04
30 MAR 1989	7615.50	18 53	13.5	-21	-57-31.0	30.2540	30.2172	-29.6124	2.21	1.000	86.94
4 APR 1989	7620.50	18 53	22.4	-21	-57-13.2	30.1683	30.2170	-29.6498	2.22	1.000	91.84
9 APR 1989	7625.50	18 53	27.7	-21	-56-59.6	30.0829	30.2169	-29.4575	2.23	1.000	96.74
14 APR 1989	7630.50	18 53	29.5	-21	-56-50.7	29.9984	30.2168	-29.0399	2.23	1.000	101.63
19 APR 1989	7635.50	18 53	27.6	-21	-56-46.7	29.9154	30.2167	-28.4153	2.24	1.000	106.53
24 APR 1989	7640.50	18 53	22.3	-21	-56-47.1	29.8345	30.2165	-27.5978	2.25	1.000	111.43
29 APR 1989	7645.50	18 53	13.7	-21	-56-52.2	29.7562	30.2164	-26.5871	2.25	1.000	116.32
4 MAY 1989	7650.50	18 53	1.7	-21	-57 -1.9	29.6811	30.2163	-25.3734	2.26	1.000	121.22
9 MAY 1989	7655.50	18 52	46.5	-21	-57-15.7	29.6099	30.2161	-23.9601	2.26	1.000	126.12
14 MAY 1989	7660.50	18 52	28.4	-21	-57-34.0	29.5429	30.2160	-22.3700	2.27	1.000	131.02
19 MAY 1989	7665.50	18 52	7.4	-21	-57-56.1	29.4808	30.2159	-20.6272	2.27	1.000	135.92
24 MAY 1989	7670.50	18 51	43.8	-21	-58-21.7	29.4239	30.2158	-18.7468	2.28	1.000	140.82
29 MAY 1989	7675.50	18 51	17.9	-21	-58-50.9	29.3727	30.2156	-16.7294	2.28	1.000	145.72
3 JUN 1989	7680.50	18 50	49.7	-21	-59-22.9	29.3274	30.2155	-14.5746	2.28	1.000	150.62
8 JUN 1989	7685.50	18 50	19.8	-21	-59-57.7	29.2886	30.2154	-12.3043	2.29	1.000	155.52
13 JUN 1989	7690.50	18 49	48.2	-22	0-35.0	29.2566	30.2152	-9.9507	2.29	1.000	160.42
18 JUN 1989	7695.50	18 49	15.4	-22	-1-13.9	29.2312	30.2151	-7.5373	2.29	1.000	165.31
23 JUN 1989	7700.50	18 48	41.6	-22	-1-54.5	29.2130	30.2150	-5.0768	2.29	1.000	170.22
28 JUN 1989	7705.50	18 48	7.2	-22	-2-36.3	29.2019	30.2149	-2.5705	2.29	1.000	175.05
3 JUL 1989	7710.50	18 47	32.4	-22	-3-18.7	29.1982	30.2147	-0.0303	2.29	1.000	-179.06
8 JUL 1989	7715.50	18 46	57.5	-22	-4 -1.8	29.2017	30.2146	2.5094	2.29	1.000	-174.96
13 JUL 1989	7720.50	18 46	23.0	-22	-4-44.6	29.2126	30.2145	5.0183	2.29	1.000	-170.10
18 JUL 1989	7725.50	18 45	49.2	-22	-5-27.1	29.2307	30.2144	7.4791	2.29	1.000	-165.22

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (^m)	PHASE	ELONG
23 JUL 1989	7730.50	18 45 16.3	-22 -6 -9.1	29.2558	30.2142	9.8849	7.68	2.29	1.000	-160.33	
28 JUL 1989	7735.50	18 44 44.7	-22 -6 -49.8	29.2877	30.2141	12.2329	7.68	2.29	1.000	-155.43	
2 AUG 1989	7740.50	18 44 14.7	-22 -7 -29.4	29.3263	30.2140	14.5001	7.69	2.28	1.000	-150.54	
7 AUG 1989	7745.50	18 43 46.4	-22 -8 -7.5	29.3713	30.2139	16.6520	7.69	2.28	1.000	-145.64	
12 AUG 1989	7750.50	18 43 20.3	-22 -8 -43.4	29.4224	30.2137	18.6685	7.69	2.28	1.000	-140.75	
17 AUG 1989	7755.50	18 42 56.7	-22 -9 -17.4	29.4790	30.2136	20.5428	7.70	2.27	1.000	-135.85	
22 AUG 1989	7760.50	18 42 35.5	-22 -9 -49.1	29.5409	30.2135	22.2758	7.70	2.27	1.000	-130.96	
27 AUG 1989	7765.50	18 42 17.3	-22 -10 -18.0	29.6075	30.2134	23.8607	7.71	2.26	1.000	-126.07	
1 SEP 1989	7770.50	18 42 2.0	-22 -10 -44.5	29.6785	30.2132	25.2711	7.71	2.26	1.000	-121.18	
6 SEP 1989	7775.50	18 41 49.8	-22 -11 -7.8	29.7533	30.2131	26.4834	7.72	2.25	1.000	-116.29	
11 SEP 1989	7780.50	18 41 41.0	-22 -11 -28.1	29.8313	30.2130	27.4919	7.72	2.25	1.000	-111.40	
16 SEP 1989	7785.50	18 41 35.6	-22 -11 -45.4	29.9119	30.2129	28.3030	7.73	2.24	1.000	-106.51	
21 SEP 1989	7790.50	18 41 33.6	-22 -11 -58.9	29.9948	30.2127	28.9221	7.74	2.23	1.000	-101.62	
26 SEP 1989	7795.50	18 41 35.2	-22 -12 -9.3	30.0787	30.2126	29.3387	7.74	2.23	1.000	-96.73	
1 OCT 1989	7800.50	18 41 40.4	-22 -12 -16.2	30.1638	30.2125	29.5335	7.75	2.22	1.000	-91.84	
6 OCT 1989	7805.50	18 41 49.1	-22 -12 -19.1	30.2491	30.2124	29.4987	7.75	2.22	1.000	-86.95	
11 OCT 1989	7810.50	18 42 1.5	-22 -12 -18.5	30.3340	30.2122	29.2446	7.76	2.21	1.000	-82.07	
16 OCT 1989	7815.50	18 42 17.3	-22 -12 -14.0	30.4178	30.2121	28.7885	7.77	2.20	1.000	-77.18	
21 OCT 1989	7820.50	18 42 36.6	-22 -12 -5.6	30.5000	30.2120	28.1354	7.77	2.20	1.000	-72.29	
26 OCT 1989	7825.50	18 42 59.2	-22 -11 -53.5	30.5801	30.2119	27.2762	7.78	2.19	1.000	-67.40	
31 OCT 1989	7830.50	18 43 25.0	-22 -11 -37.3	30.6574	30.2118	26.2050	7.78	2.19	1.000	-62.50	
5 NOV 1989	7835.50	18 43 54.0	-22 -11 -17.1	30.7312	30.2116	24.9309	7.79	2.18	1.000	-57.61	
10 NOV 1989	7840.50	18 44 25.8	-22 -10 -53.3	30.8012	30.2115	23.4785	7.79	2.18	1.000	-52.71	
15 NOV 1989	7845.50	18 45 0.4	-22 -10 -25.3	30.8667	30.2114	21.8695	7.80	2.17	1.000	-47.82	
20 NOV 1989	7850.50	18 45 37.5	-22 -9 -53.8	30.9273	30.2113	20.1060	7.80	2.17	1.000	-42.92	
25 NOV 1989	7855.50	18 46 16.9	-22 -9 -18.6	30.9827	30.2111	18.1861	7.81	2.16	1.000	-38.02	
30 NOV 1989	7860.50	18 46 58.5	-22 -8 -39.6	31.0322	30.2110	16.1195	7.81	2.16	1.000	-33.12	
5 DEC 1989	7865.50	18 47 41.9	-22 -7 -57.4	31.0756	30.2109	13.9294	7.81	2.16	1.000	-28.22	
10 DEC 1989	7870.50	18 48 26.9	-22 -7 -11.8	31.1126	30.2108	11.6487	7.82	2.15	1.000	-23.32	
15 DEC 1989	7875.50	18 49 13.2	-22 -6 -23.1	31.1428	30.2107	9.2953	7.82	2.15	1.000	-18.42	
20 DEC 1989	7880.50	18 50 0.6	-22 -5 -31.8	31.1662	30.2105	6.8697	7.82	2.15	1.000	-13.52	
25 DEC 1989	7885.50	18 50 48.8	-22 -4 -37.7	31.1825	30.2104	4.3808	7.82	2.15	1.000	-8.63	
30 DEC 1989	7890.50	18 51 37.5	-22 -3 -41.5	31.1915	30.2103	1.8497	7.82	2.15	1.000	-3.78	

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1990	7895.50	18 52 26.4	-22	-2-43.5	31.1931	30.2102	-0.6917	7.82	2.15	1.000	1.49
9 JAN 1990	7900.50	18 53 15.2	-22	-1-43.7	31.1875	30.2101	-3.2122	7.82	2.15	1.000	6.19
14 JAN 1990	7905.50	18 54 3.6	-22	0-43.0	31.1746	30.2099	-8.1037	7.82	2.15	1.000	11.07
19 JAN 1990	7910.50	18 54 51.4	-21	-59-41.4	31.1548	30.2098	-8.1643	7.82	2.15	1.000	15.96
24 JAN 1990	7915.50	18 55 38.2	-21	-58-39.3	31.1275	30.2097	-10.5769	7.82	2.15	1.000	20.86
29 JAN 1990	7920.50	18 56 23.9	-21	-57-37.6	31.0936	30.2096	-12.9150	7.81	2.16	1.000	25.77
3 FEB 1990	7925.50	18 57 8.1	-21	-56-36.2	31.0530	30.2095	-15.1468	7.81	2.16	1.000	30.67
8 FEB 1990	7930.50	18 57 50.5	-21	-55-35.8	31.0062	30.2093	-17.2540	7.81	2.16	1.000	35.57
13 FEB 1990	7935.50	18 58 31.0	-21	-54-37.1	30.9535	30.2092	-19.2385	7.80	2.16	1.000	40.47
18 FEB 1990	7940.50	18 59 9.2	-21	-53-40.0	30.8952	30.2091	-21.0962	7.80	2.17	1.000	45.37
23 FEB 1990	7945.50	18 59 45.1	-21	-52-45.5	30.8318	30.2090	-22.8072	7.80	2.17	1.000	50.27
28 FEB 1990	7950.50	19 0 18.3	-21	-51-53.8	30.7637	30.2089	-24.3461	7.79	2.18	1.000	55.17
5 MAR 1990	7955.50	19 0 48.0	-21	-51-5.1	30.6914	30.2087	-25.6922	7.79	2.18	1.000	60.07
10 MAR 1990	7960.50	19 1 16.0	-21	-50-20.4	30.6155	30.2086	-26.8450	7.78	2.19	1.000	64.98
15 MAR 1990	7965.50	19 1 40.2	-21	-49-39.6	30.5365	30.2085	-27.8131	7.77	2.19	1.000	69.85
20 MAR 1990	7970.50	19 2 1.2	-21	-49-2.9	30.4550	30.2084	-28.5914	7.77	2.20	1.000	74.75
25 MAR 1990	7975.50	19 2 18.8	-21	-48-31.1	30.3716	30.2083	-29.1623	7.76	2.21	1.000	79.64
30 MAR 1990	7980.50	19 2 32.9	-21	-48-4.0	30.2868	30.2081	-29.5081	7.76	2.21	1.000	84.54
4 APR 1990	7985.50	19 2 43.5	-21	-47-42.1	30.2014	30.2080	-29.6275	7.75	2.22	1.000	89.43
9 APR 1990	7990.50	19 2 50.6	-21	-47-25.6	30.1159	30.2079	-29.6360	7.74	2.23	1.000	94.32
14 APR 1990	7995.50	19 2 54.0	-21	-47-14.2	30.0310	30.2078	-29.2417	7.74	2.23	1.000	99.21
19 APR 1990	8000.50	19 2 54.0	-21	-47-8.4	29.9472	30.2077	-28.7442	7.73	2.24	1.000	104.10
24 APR 1990	8005.50	19 2 50.4	-21	-47-8.1	29.8652	30.2076	-28.0298	7.73	2.24	1.000	108.99
29 APR 1990	8010.50	19 2 43.4	-21	-47-12.9	29.7855	30.2074	-27.0964	7.72	2.25	1.000	113.89
4 MAY 1990	8015.50	19 2 33.1	-21	-47-23.4	29.7089	30.2073	-25.9622	7.71	2.26	1.000	118.78
9 MAY 1990	8020.50	19 2 19.5	-21	-47-38.8	29.6358	30.2072	-24.6494	7.71	2.26	1.000	123.67
14 MAY 1990	8025.50	19 2 2.9	-21	-47-59.0	29.5667	30.2071	-23.1697	7.70	2.27	1.000	128.56
19 MAY 1990	8030.50	19 1 43.4	-21	-48-24.1	29.5021	30.2070	-21.5222	7.70	2.27	1.000	133.46
24 MAY 1990	8035.50	19 1 21.1	-21	-48-53.4	29.4425	30.2069	-19.7031	7.70	2.28	1.000	138.35
29 MAY 1990	8040.50	19 0 56.4	-21	-49-26.8	29.3885	30.2067	-17.7293	7.69	2.28	1.000	143.25
3 JUN 1990	8045.50	19 0 29.4	-21	-50-4.0	29.3403	30.2066	-15.6318	7.69	2.28	1.000	148.15
8 JUN 1990	8050.50	19 0 0.4	-21	-50-44.2	29.2983	30.2065	-13.4328	7.68	2.29	1.000	153.04
13 JUN 1990	8055.50	18 59 29.7	-21	-51-27.4	29.2628	30.2064	-11.1434	7.68	2.29	1.000	157.94
18 JUN 1990	8060.50	18 58 57.5	-21	-52-13.0	29.2340	30.2063	-8.7651	7.68	2.29	1.000	162.84
23 JUN 1990	8065.50	18 58 24.3	-21	-53-0.3	29.2122	30.2062	-6.3067	7.68	2.29	1.000	167.73
28 JUN 1990	8070.50	18 57 50.2	-21	-53-49.5	29.1976	30.2061	-3.8002	7.68	2.30	1.000	172.61
3 JUL 1990	8075.50	18 57 15.5	-21	-54-39.5	29.1903	30.2059	-1.2783	7.68	2.30	1.000	177.41
8 JUL 1990	8080.50	18 56 40.8	-21	-55-30.0	29.1902	30.2058	1.2421	7.68	2.30	1.000	-177.38
13 JUL 1990	8085.50	18 56 6.2	-21	-56-20.8	29.1974	30.2057	3.7529	7.68	2.30	1.000	-172.58
18 JUL 1990	8090.50	18 55 32.0	-21	-57-11.0	29.2119	30.2056	6.2496	7.68	2.29	1.000	-167.70

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1990	8095.50	18 54 58.7	-21-58-07.7	29.2335	30.2055	8.7116	7.68	2.29	1.000	1.000	-162.80
28 JUL 1990	8100.50	18 54 26.4	-21-58-49.3	29.2621	30.2054	11.1018	7.68	2.29	1.000	1.000	-157.91
2 AUG 1990	8105.50	18 53 55.6	-21-59-38.1	29.2975	30.2053	13.3965	7.68	2.29	1.000	1.000	-148.11
7 AUG 1990	8110.50	18 53 26.6	-22 0-21.2	29.3394	30.2051	15.5876	7.69	2.28	1.000	1.000	-143.22
12 AUG 1990	8115.50	18 52 59.4	-22 1-4.1	29.3875	30.2050	17.6721	7.69	2.28	1.000	1.000	-138.32
17 AUG 1990	8120.50	18 52 34.6	-22 1-44.2	29.4414	30.2049	19.6419	7.70	2.28	1.000	1.000	-133.42
22 AUG 1990	8125.50	18 52 12.2	-22 2-21.9	29.5008	30.2048	21.4698	7.70	2.27	1.000	1.000	-128.52
27 AUG 1990	8130.50	18 51 52.4	-22 2-56.2	29.5652	30.2047	23.1267	7.70	2.27	1.000	1.000	-123.62
1 SEP 1990	8135.50	18 51 35.7	-22 3-27.1	29.6342	30.2046	24.6034	7.71	2.26	1.000	1.000	-118.73
6 SEP 1990	8140.50	18 51 22.0	-22 3-54.8	29.7071	30.2045	26.9026	7.71	2.26	1.000	1.000	-113.84
11 SEP 1990	8145.50	18 51 11.5	-22 4-18.3	29.7836	30.2044	27.0280	7.72	2.25	1.000	1.000	-108.94
16 SEP 1990	8150.50	18 51 4.4	-22 4-38.2	29.8630	30.2042	27.9617	7.73	2.24	1.000	1.000	-104.04
21 SEP 1990	8155.50	18 51 0.7	-22 4-54.1	29.9449	30.2041	28.6860	7.73	2.24	1.000	1.000	-99.15
26 SEP 1990	8160.50	18 51 0.6	-22 5-5.4	30.0285	30.2040	29.1862	7.74	2.23	1.000	1.000	-94.25
1 OCT 1990	8165.50	18 51 4.0	-22 5-12.7	30.1132	30.2039	29.4684	7.74	2.23	1.000	1.000	-89.36
6 OCT 1990	8170.50	18 51 11.0	-22 5-15.5	30.1985	30.2038	29.5457	7.75	2.22	1.000	1.000	-84.47
11 OCT 1990	8175.50	18 51 21.6	-22 5-13.6	30.2837	30.2037	29.4210	7.76	2.21	1.000	1.000	-79.57
16 OCT 1990	8180.50	18 51 35.7	-22 5-7.6	30.3682	30.2036	29.0820	7.76	2.21	1.000	1.000	-74.67
21 OCT 1990	8185.50	18 51 53.2	-22 4-58.5	30.4514	30.2035	28.5178	7.77	2.20	1.000	1.000	-69.78
26 OCT 1990	8190.50	18 52 14.2	-22 4-41.0	30.5327	30.2034	27.7338	7.77	2.19	1.000	1.000	-64.88
31 OCT 1990	8195.50	18 52 38.5	-22 4-20.9	30.6114	30.2032	26.7499	7.78	2.19	1.000	1.000	-59.98
5 NOV 1990	8200.50	18 53 5.9	-22 3-56.0	30.6870	30.2031	25.5853	7.79	2.18	1.000	1.000	-55.08
10 NOV 1990	8205.50	18 53 36.3	-22 3-28.8	30.7590	30.2030	24.2410	7.79	2.18	1.000	1.000	-50.18
15 NOV 1990	8210.50	18 54 9.5	-22 2-53.1	30.8268	30.2029	22.7107	7.79	2.17	1.000	1.000	-45.28
20 NOV 1990	8215.50	18 54 45.4	-22 2-14.7	30.8900	30.2028	21.0007	7.80	2.17	1.000	1.000	-40.38
25 NOV 1990	8220.50	18 55 23.7	-22 1-32.4	30.9480	30.2027	19.1313	7.80	2.17	1.000	1.000	-35.48
30 NOV 1990	8225.50	18 56 4.1	-22 0-45.9	31.0004	30.2026	17.1319	7.81	2.16	1.000	1.000	-30.57
5 DEC 1990	8230.50	18 56 46.6	-21-59-55.4	31.0468	30.2025	15.0210	7.81	2.16	1.000	1.000	-25.67
10 DEC 1990	8235.50	18 57 30.8	-21-59-1.5	31.0870	30.2024	12.7977	7.81	2.16	1.000	1.000	-20.77
15 DEC 1990	8240.50	18 58 16.4	-21-58-3.8	31.1206	30.2023	10.4671	7.82	2.15	1.000	1.000	-15.86
20 DEC 1990	8245.50	18 59 3.2	-21-57-3.2	31.1474	30.2022	8.0501	7.82	2.15	1.000	1.000	-10.96
25 DEC 1990	8250.50	18 59 51.0	-21-55-59.8	31.1671	30.2020	5.5764	7.82	2.15	1.000	1.000	-6.06
30 DEC 1990	8255.50	19 0 39.3	-21-54-53.7	31.1796	30.2019	3.0769	7.82	2.15	1.000	1.000	-1.16

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1991	8260.50	19 1 28.0	-21-53-45.8	31.1848	30.2018	0.5626	7.82	2.15	1.000	-1.37	
9 JAN 1991	8265.50	19 2 16.8	-21-52-36.1	31.1828	30.2017	-1.9663	7.82	2.15	1.000	3.86	
14 JAN 1991	8270.50	19 3 5.3	-21-51-25.0	31.1735	30.2016	-4.4933	7.82	2.15	1.000	8.72	
19 JAN 1991	8275.50	19 3 53.4	-21-50-13.3	31.1569	30.2015	-6.9899	7.82	2.15	1.000	13.62	
24 JAN 1991	8280.50	19 4 40.6	-21-49-1.2	31.1332	30.2014	-9.4252	7.82	2.15	1.000	18.52	
29 JAN 1991	8285.50	19 5 26.7	-21-47-49.2	31.1025	30.2013	-11.7768	7.81	2.15	1.000	23.42	
3 FEB 1991	8290.50	19 6 11.5	-21-46-38.1	31.0652	30.2012	-14.0436	7.81	2.16	1.000	28.31	
8 FEB 1991	8295.50	19 6 54.7	-21-45-27.9	31.0215	30.2011	-16.2220	7.81	2.16	1.000	33.21	
13 FEB 1991	8300.50	19 7 36.1	-21-44-19.6	30.9716	30.2010	-18.2894	7.80	2.16	1.000	38.11	
18 FEB 1991	8305.50	19 8 15.3	-21-43-13.5	30.9160	30.2009	-20.2180	7.80	2.17	1.000	43.01	
23 FEB 1991	8310.50	19 8 52.2	-21-42-9.9	30.8550	30.2008	-21.9845	7.80	2.17	1.000	47.90	
28 FEB 1991	8315.50	19 9 26.6	-21-41-9.8	30.7892	30.2006	-23.5828	7.79	2.18	1.000	52.80	
5 MAR 1991	8320.50	19 9 58.3	-21-40-13.2	30.7190	30.2005	-25.0193	7.79	2.18	1.000	57.69	
10 MAR 1991	8325.50	19 10 27.1	-21-39-20.6	30.6449	30.2004	-26.2870	7.78	2.19	1.000	62.58	
15 MAR 1991	8330.50	19 10 52.8	-21-38-32.8	30.5673	30.2003	-27.3642	7.78	2.19	1.000	67.47	
20 MAR 1991	8335.50	19 11 15.3	-21-37-49.7	30.4870	30.2002	-28.2308	7.77	2.20	1.000	72.36	
25 MAR 1991	8340.50	19 11 34.5	-21-37-11.8	30.4045	30.2001	-28.8792	7.76	2.20	1.000	77.25	
30 MAR 1991	8345.50	19 11 50.2	-21-36-39.8	30.3204	30.2000	-29.3201	7.76	2.21	1.000	82.13	
4 APR 1991	8350.50	19 12 2.5	-21-36-13.1	30.2354	30.1999	-29.5622	7.75	2.22	1.000	87.02	
9 APR 1991	8355.50	19 12 11.4	-21-35-52.6	30.1499	30.1998	-29.5985	7.75	2.22	1.000	91.90	
14 APR 1991	8360.50	19 12 16.6	-21-35-38.3	30.0646	30.1997	-29.4133	7.74	2.23	1.000	96.79	
19 APR 1991	8365.50	19 12 18.3	-21-35-29.8	29.9802	30.1996	-28.9995	7.73	2.24	1.000	101.68	
24 APR 1991	8370.50	19 12 16.4	-21-35-28.0	29.8973	30.1995	-28.3700	7.73	2.24	1.000	106.56	
29 APR 1991	8375.50	19 12 11.1	-21-35-32.1	29.8166	30.1994	-27.5447	7.72	2.25	1.000	111.45	
4 MAY 1991	8380.50	19 12 2.5	-21-35-42.1	29.7384	30.1993	-26.5322	7.72	2.25	1.000	116.33	
9 MAY 1991	8385.50	19 11 50.6	-21-35-58.4	29.6635	30.1992	-25.3284	7.71	2.26	1.000	121.22	
14 MAY 1991	8390.50	19 11 35.5	-21-36-20.1	29.5923	30.1991	-23.9272	7.71	2.26	1.000	126.11	
19 MAY 1991	8395.50	19 11 17.5	-21-36-47.2	29.5255	30.1990	-22.3392	7.70	2.27	1.000	131.00	
24 MAY 1991	8400.50	19 10 56.6	-21-37-19.7	29.4635	30.1989	-20.5929	7.70	2.27	1.000	135.89	
29 MAY 1991	8405.50	19 10 33.2	-21-37-56.6	29.4067	30.1988	-18.7099	7.69	2.28	1.000	140.78	
3 JUN 1991	8410.50	19 10 7.4	-21-38-38.0	29.3555	30.1987	-16.6978	7.69	2.28	1.000	145.67	
8 JUN 1991	8415.50	19 9 39.4	-21-39-23.4	29.3104	30.1985	-14.5576	7.69	2.29	1.000	150.57	
13 JUN 1991	8420.50	19 9 9.6	-21-40-11.9	29.2716	30.1984	-12.2949	7.68	2.29	1.000	155.46	
18 JUN 1991	8425.50	19 8 38.3	-21-41-3.7	29.2395	30.1983	-9.9376	7.68	2.29	1.000	160.36	
23 JUN 1991	8430.50	19 8 5.6	-21-41-57.7	29.2143	30.1982	-7.5198	7.68	2.29	1.000	165.25	
28 JUN 1991	8435.50	19 7 32.0	-21-42-53.5	29.1961	30.1981	-5.0579	7.68	2.30	1.000	170.14	
3 JUL 1991	8440.50	19 6 57.7	-21-43-50.9	29.1851	30.1980	-2.8592	7.68	2.30	1.000	175.01	
8 JUL 1991	8445.50	19 6 23.1	-21-44-48.9	29.1813	30.1979	-0.0293	7.68	2.30	1.000	-179.19	
13 JUL 1991	8450.50	19 5 48.5	-21-45-47.3	29.1849	30.1978	2.5138	7.68	2.30	1.000	-175.05	
18 JUL 1991	8455.50	19 5 14.1	-21-46-45.6	29.1958	30.1977	5.0327	7.68	2.30	1.000	-170.18	

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
23 JUL 1991	8480.50	19 4 40.4	-21-47-42.9	29.2139	30.1976	7.4999	7.68	2.29	1.000	-165.29	
28 JUL 1991	8485.50	19 4 7.7	-21-48-39.2	29.2391	30.1975	9.9069	7.68	2.29	1.000	-160.39	
2 AUG 1991	8470.50	19 3 36.2	-21-49-33.8	29.2711	30.1974	12.2484	7.68	2.29	1.000	-155.50	
7 AUG 1991	8475.50	19 3 6.3	-21-50-26.1	29.3098	30.1973	14.5144	7.68	2.29	1.000	-150.59	
12 AUG 1991	8480.50	19 2 38.2	-21-51-16.3	29.3548	30.1972	16.6783	7.69	2.28	1.000	-145.69	
17 AUG 1991	8485.50	19 2 12.2	-21-52-3.2	29.4059	30.1971	18.7085	7.69	2.28	1.000	-140.79	
22 AUG 1991	8490.50	19 1 48.6	-21-52-47.0	29.4627	30.1970	20.5858	7.69	2.27	1.000	-135.88	
27 AUG 1991	8495.50	19 1 27.6	-21-53-27.3	29.5247	30.1969	22.3164	7.70	2.27	1.000	-130.98	
1 SEP 1991	8500.50	19 1 9.4	-21-54-3.5	29.5915	30.1968	23.8960	7.71	2.26	1.000	-126.08	
6 SEP 1991	8505.50	19 0 54.2	-21-54-35.8	29.6625	30.1967	25.3115	7.71	2.26	1.000	-121.18	
11 SEP 1991	8510.50	19 0 42.1	-21-55-3.7	29.7375	30.1966	26.5360	7.72	2.25	1.000	-116.28	
16 SEP 1991	8515.50	19 0 33.4	-21-55-26.8	29.8150	30.1965	27.5509	7.72	2.25	1.000	-111.38	
21 SEP 1991	8520.50	19 0 28.0	-21-55-45.3	29.8964	30.1964	28.3589	7.73	2.24	1.000	-106.48	
26 SEP 1991	8525.50	19 0 26.1	-21-55-58.8	29.9792	30.1963	28.9687	7.73	2.24	1.000	-101.58	
1 OCT 1991	8530.50	19 0 27.8	-21-56-7.1	30.0635	30.1962	29.3805	7.74	2.23	1.000	-96.68	
6 OCT 1991	8535.50	19 0 33.0	-21-56-10.6	30.1487	30.1961	29.5798	7.75	2.22	1.000	-91.78	
11 OCT 1991	8540.50	19 0 41.8	-21-56-8.4	30.2341	30.1960	29.5497	7.75	2.22	1.000	-86.87	
16 OCT 1991	8545.50	19 0 54.2	-21-56-1.0	30.3191	30.1959	29.2918	7.76	2.21	1.000	-81.97	
21 OCT 1991	8550.50	19 1 10.0	-21-55-48.4	30.4031	30.1958	28.8217	7.76	2.20	1.000	-77.07	
26 OCT 1991	8555.50	19 1 29.3	-21-55-30.2	30.4854	30.1957	28.1549	7.77	2.20	1.000	-72.17	
31 OCT 1991	8560.50	19 1 52.0	-21-55-6.8	30.5655	30.1956	27.2912	7.78	2.19	1.000	-67.27	
5 NOV 1991	8565.50	19 2 17.8	-21-54-38.2	30.6428	30.1955	26.2200	7.78	2.19	1.000	-62.36	
10 NOV 1991	8570.50	19 2 46.7	-21-54-4.0	30.7167	30.1954	24.9429	7.79	2.18	1.000	-57.45	
15 NOV 1991	8575.50	19 3 18.5	-21-53-25.0	30.7867	30.1953	23.4777	7.79	2.18	1.000	-52.55	
20 NOV 1991	8580.50	19 3 53.0	-21-52-40.9	30.8522	30.1952	21.8493	7.80	2.17	1.000	-47.64	
25 NOV 1991	8585.50	19 4 30.1	-21-51-51.8	30.9127	30.1951	20.0754	7.80	2.17	1.000	-42.74	
30 NOV 1991	8590.50	19 5 9.5	-21-50-58.4	30.9680	30.1950	18.1542	7.80	2.16	1.000	-37.83	
5 DEC 1991	8595.50	19 5 50.9	-21-50-0.2	31.0175	30.1949	16.0861	7.81	2.16	1.000	-32.92	
10 DEC 1991	8600.50	19 6 34.2	-21-48-58.0	31.0608	30.1948	13.8902	7.81	2.16	1.000	-28.02	
15 DEC 1991	8605.50	19 7 19.1	-21-47-52.2	31.0976	30.1947	11.5945	7.81	2.15	1.000	-23.11	
20 DEC 1991	8610.50	19 8 5.2	-21-46-42.5	31.1277	30.1946	9.2276	7.82	2.15	1.000	-18.20	
25 DEC 1991	8615.50	19 8 52.4	-21-45-29.9	31.1508	30.1945	6.8029	7.82	2.15	1.000	-13.30	
30 DEC 1991	8620.50	19 9 40.4	-21-44-14.5	31.1669	30.1944	4.3189	7.82	2.15	1.000	-8.41	

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
4 JAN 1992	8625.50	19 10 28.9	-21-42-56.6	31.1757	30.1943	1.7898	7.82	2.15	1.000		-3.54
9 JAN 1992	8630.50	19 11 17.5	-21-41-37.1	31.1772	30.1942	-0.7549	7.82	2.15	1.000		1.62
14 JAN 1992	8635.50	19 12 6.0	-21-40-16.1	31.1714	30.1941	-3.2848	7.82	2.15	1.000		6.39
19 JAN 1992	8640.50	19 12 54.2	-21-38-54.1	31.1583	30.1940	-5.7758	7.82	2.15	1.000		11.27
24 JAN 1992	8645.50	19 13 41.7	-21-37-32.1	31.1381	30.1939	-8.2232	7.82	2.15	1.000		16.17
29 JAN 1992	8650.50	19 14 28.2	-21-36-9.9	31.1108	30.1938	-10.6249	7.81	2.15	1.000		21.07
3 FEB 1992	8655.50	19 15 13.6	-21-34-48.6	31.0768	30.1937	-12.9572	7.81	2.16	1.000		25.96
8 FEB 1992	8660.50	19 15 57.5	-21-33-28.8	31.0361	30.1936	-15.1893	7.81	2.16	1.000		30.86
13 FEB 1992	8665.50	19 16 39.6	-21-32-10.6	30.9892	30.1936	-17.2967	7.81	2.16	1.000		35.76
18 FEB 1992	8670.50	19 17 19.8	-21-30-55.0	30.9363	30.1935	-19.2684	7.80	2.17	1.000		40.65
23 FEB 1992	8675.50	19 17 57.7	-21-29-42.4	30.8780	30.1934	-21.1078	7.80	2.17	1.000		45.54
28 FEB 1992	8680.50	19 18 33.2	-21-28-33.2	30.8146	30.1933	-22.8077	7.79	2.17	1.000		50.43
4 MAR 1992	8685.50	19 19 6.2	-21-27-28.2	30.7464	30.1932	-24.3427	7.79	2.18	1.000		55.32
9 MAR 1992	8690.50	19 19 36.2	-21-26-27.6	30.6741	30.1931	-25.6891	7.78	2.18	1.000		60.20
14 MAR 1992	8695.50	19 20 3.4	-21-25-32.0	30.5983	30.1930	-26.8360	7.78	2.19	1.000		65.09
19 MAR 1992	8700.50	19 20 27.4	-21-24-42.1	30.5193	30.1929	-27.7882	7.77	2.20	1.000		69.97
24 MAR 1992	8705.50	19 20 48.1	-21-23-57.7	30.4379	30.1928	-28.5528	7.77	2.20	1.000		74.85
29 MAR 1992	8710.50	19 21 5.6	-21-23-19.5	30.3548	30.1927	-29.1198	7.76	2.21	1.000		79.73
3 APR 1992	8715.50	19 21 19.5	-21-22-47.9	30.2700	30.1926	-29.4696	7.75	2.21	1.000		84.61
8 APR 1992	8720.50	19 21 30.0	-21-22-22.6	30.1846	30.1925	-29.5914	7.75	2.22	1.000		89.49
13 APR 1992	8725.50	19 21 37.0	-21-22-4.4	30.0993	30.1924	-29.4920	7.74	2.23	1.000		94.37
18 APR 1992	8730.50	19 21 40.4	-21-21-53.0	30.0145	30.1923	-29.1885	7.74	2.23	1.000		99.25
23 APR 1992	8735.50	19 21 40.4	-21-21-48.5	29.9309	30.1922	-28.6871	7.73	2.24	1.000		104.13
28 APR 1992	8740.50	19 21 36.8	-21-21-51.0	29.8490	30.1921	-27.9798	7.72	2.24	1.000		109.01
3 MAY 1992	8745.50	19 21 29.9	-21-22-0.3	29.7695	30.1920	-27.0575	7.72	2.25	1.000		113.89
8 MAY 1992	8750.50	19 21 19.6	-21-22-16.3	29.6930	30.1919	-25.9255	7.71	2.26	1.000		118.77
13 MAY 1992	8755.50	19 21 6.1	-21-22-38.9	29.6200	30.1918	-24.6081	7.71	2.26	1.000		123.66
18 MAY 1992	8760.50	19 20 49.8	-21-23-7.4	29.5510	30.1917	-23.1257	7.70	2.27	1.000		128.54
23 MAY 1992	8765.50	19 20 30.3	-21-23-42.0	29.4865	30.1916	-21.4830	7.70	2.27	1.000		133.42
28 MAY 1992	8770.50	19 20 8.2	-21-24-22.1	29.4271	30.1915	-19.6782	7.69	2.28	1.000		138.31
2 JUN 1992	8775.50	19 19 43.6	-21-25-7.0	29.3730	30.1914	-17.7146	7.69	2.28	1.000		143.20
7 JUN 1992	8780.50	19 19 16.8	-21-25-56.7	29.3249	30.1913	-15.6149	7.69	2.29	1.000		148.09
12 JUN 1992	8785.50	19 18 48.0	-21-26-50.4	29.2830	30.1912	-13.4125	7.68	2.29	1.000		152.98
17 JUN 1992	8790.50	19 18 17.5	-21-27-47.5	29.2475	30.1912	-11.1240	7.68	2.29	1.000		157.87
22 JUN 1992	8795.50	19 17 45.6	-21-28-47.7	29.2188	30.1911	-8.7539	7.68	2.29	1.000		162.77
27 JUN 1992	8800.50	19 17 12.6	-21-29-50.1	29.1970	30.1910	-6.3082	7.68	2.30	1.000		167.66
2 JUL 1992	8805.50	19 16 38.7	-21-30-54.3	29.1824	30.1909	-3.8025	7.67	2.30	1.000		172.54
7 JUL 1992	8810.50	19 16 4.3	-21-31-59.9	29.1751	30.1908	-1.2717	7.67	2.30	1.000		177.38
12 JUL 1992	8815.50	19 15 29.7	-21-33-5.6	29.1751	30.1907	1.2532	7.67	2.30	1.000		-177.50
17 JUL 1992	8820.50	19 14 55.4	-21-34-11.5	29.1823	30.1906	3.7634	7.67	2.30	1.000		-172.67

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1992	8825.50	19 14	21.4	-21-35-16.9	29.1968	30.1905	6.2534	7.68	2.30	1.000	-167.79
27 JUL 1992	8830.50	19 13	48.2	-21-36-20.8	29.2184	30.1904	8.7115	7.68	2.29	1.000	-162.89
1 AUG 1992	8835.50	19 13	16.2	-21-37-23.3	29.2470	30.1903	11.1121	7.68	2.29	1.000	-157.98
6 AUG 1992	8840.50	19 12	45.5	-21-38-23.3	29.2825	30.1902	13.4194	7.68	2.29	1.000	-153.08
11 AUG 1992	8845.50	19 12	16.6	-21-39-20.6	29.3244	30.1901	15.6151	7.69	2.29	1.000	-148.17
16 AUG 1992	8850.50	19 11	49.6	-21-40-14.9	29.3726	30.1900	17.6985	7.69	2.28	1.000	-143.27
21 AUG 1992	8855.50	19 11	24.9	-21-41-5.4	29.4265	30.1899	19.6843	7.69	2.28	1.000	-138.36
26 AUG 1992	8860.50	19 11	2.6	-21-41-52.0	29.4880	30.1898	21.4970	7.70	2.27	1.000	-133.45
31 AUG 1992	8865.50	19 10	43.0	-21-42-34.3	29.5505	30.1897	23.1684	7.70	2.27	1.000	-128.55
5 SEP 1992	8870.50	19 10	26.3	-21-43-11.6	29.6196	30.1896	24.6543	7.71	2.26	1.000	-123.64
10 SEP 1992	8875.50	19 10	12.8	-21-43-44.3	29.6928	30.1896	25.9531	7.71	2.26	1.000	-118.73
15 SEP 1992	8880.50	19 10	2.3	-21-44-11.6	29.7694	30.1895	27.0707	7.72	2.25	1.000	-113.83
20 SEP 1992	8885.50	19 9	55.2	-21-44-33.3	29.8489	30.1894	28.0034	7.72	2.24	1.000	-108.92
25 SEP 1992	8890.50	19 9	51.7	-21-44-49.7	29.9309	30.1893	28.7346	7.73	2.24	1.000	-104.01
30 SEP 1992	8895.50	19 9	51.6	-21-45-0.1	30.0147	30.1892	29.2434	7.74	2.23	1.000	-99.10
5 OCT 1992	8900.50	19 9	55.1	-21-45-4.5	30.0996	30.1891	29.5250	7.74	2.23	1.000	-94.20
10 OCT 1992	8905.50	19 10	2.1	-21-45-3.1	30.1850	30.1890	29.5919	7.75	2.22	1.000	-89.29
15 OCT 1992	8910.50	19 10	12.7	-21-44-55.3	30.2703	30.1889	29.4555	7.75	2.21	1.000	-84.38
20 OCT 1992	8915.50	19 10	26.8	-21-44-41.6	30.3549	30.1888	29.1133	7.76	2.21	1.000	-79.47
25 OCT 1992	8920.50	19 10	44.4	-21-44-21.8	30.4382	30.1887	28.5516	7.77	2.20	1.000	-74.56
30 OCT 1992	8925.50	19 11	5.4	-21-43-55.7	30.5196	30.1886	27.7661	7.77	2.20	1.000	-69.65
4 NOV 1992	8930.50	19 11	29.6	-21-43-23.7	30.5984	30.1885	26.7711	7.78	2.19	1.000	-64.74
9 NOV 1992	8935.50	19 11	57.0	-21-42-45.8	30.6740	30.1884	25.5681	7.78	2.18	1.000	-59.83
14 NOV 1992	8940.50	19 12	27.3	-21-42-1.9	30.7460	30.1883	24.2318	7.79	2.18	1.000	-54.93
19 NOV 1992	8945.50	19 13	0.5	-21-41-12.7	30.8138	30.1882	22.6999	7.79	2.17	1.000	-50.02
24 NOV 1992	8950.50	19 13	36.2	-21-40-17.7	30.8769	30.1882	20.9878	7.80	2.17	1.000	-45.10
29 NOV 1992	8955.50	19 14	14.5	-21-39-17.5	30.9349	30.1881	19.1109	7.80	2.17	1.000	-40.19
4 DEC 1992	8960.50	19 14	54.8	-21-38-12.5	30.9872	30.1880	17.0960	7.81	2.16	1.000	-35.28
9 DEC 1992	8965.50	19 15	37.1	-21-37-2.7	31.0335	30.1879	14.9684	7.81	2.16	1.000	-30.37
14 DEC 1992	8970.50	19 16	21.1	-21-36-48.7	31.0735	30.1878	12.7419	7.81	2.16	1.000	-25.46
19 DEC 1992	8975.50	19 17	6.5	-21-34-30.8	31.1070	30.1877	10.4147	7.81	2.15	1.000	-20.55
24 DEC 1992	8980.50	19 17	53.2	-21-33-9.1	31.1336	30.1876	7.9962	7.82	2.15	1.000	-15.65
29 DEC 1992	8985.50	19 18	40.7	-21-31-44.6	31.1531	30.1875	5.5165	7.82	2.15	1.000	-10.74

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1993	8990.50	19 19 28.8	-21-30-17.4	31.1854	30.1874	3.0055	7.82	2.15	1.000	-5.85
8 JAN 1993	8995.50	19 20 17.2	-21-28-48.1	31.1704	30.1873	0.4866	7.82	2.15	1.000	-1.13
13 JAN 1993	9000.50	19 21 5.7	-21-27-17.4	31.1682	30.1872	-2.0324	7.82	2.15	1.000	4.05
18 JAN 1993	9005.50	19 21 53.9	-21-25-45.4	31.1587	30.1871	-4.5501	7.82	2.15	1.000	8.92
23 JAN 1993	9010.50	19 22 41.6	-21-24-13.1	31.1420	30.1870	-7.0442	7.82	2.15	1.000	13.82
28 JAN 1993	9015.50	19 23 28.5	-21-22-41.0	31.1181	30.1869	-9.4809	7.81	2.15	1.000	18.72
2 FEB 1993	9020.50	19 24 14.3	-21-21-9.6	31.0873	30.1868	-11.8349	7.81	2.16	1.000	23.61
7 FEB 1993	9025.50	19 24 58.7	-21-19-39.7	31.0498	30.1868	-14.0921	7.81	2.16	1.000	28.50
12 FEB 1993	9030.50	19 25 41.6	-21-18-11.8	31.0080	30.1867	-16.2524	7.81	2.16	1.000	33.39
17 FEB 1993	9035.50	19 26 22.6	-21-16-46.3	30.9561	30.1866	-18.3090	7.80	2.16	1.000	38.28
22 FEB 1993	9040.50	19 27 1.5	-21-15-24.3	30.9004	30.1865	-20.2340	7.80	2.17	1.000	43.17
27 FEB 1993	9045.50	19 27 38.1	-21-14-6.0	30.8394	30.1864	-22.0000	7.79	2.17	1.000	48.06
4 MAR 1993	9050.50	19 28 12.2	-21-12-52.0	30.7735	30.1863	-23.5931	7.79	2.18	1.000	52.94
9 MAR 1993	9055.50	19 28 43.5	-21-11-43.2	30.7033	30.1862	-25.0133	7.78	2.18	1.000	57.82
14 MAR 1993	9060.50	19 29 12.0	-21-10-39.4	30.6292	30.1861	-26.2851	7.78	2.19	1.000	62.70
19 MAR 1993	9065.50	19 29 37.5	-21-9-41.7	30.5517	30.1860	-27.3370	7.77	2.19	1.000	67.57
24 MAR 1993	9070.50	19 29 59.8	-21-8-50.5	30.4715	30.1859	-28.2050	7.77	2.20	1.000	72.45
29 MAR 1993	9075.50	19 30 18.8	-21-8-6.7	30.3890	30.1858	-28.8546	7.76	2.21	1.000	77.33
3 APR 1993	9080.50	19 30 34.4	-21-7-28.1	30.3050	30.1857	-29.2878	7.76	2.21	1.000	82.20
8 APR 1993	9085.50	19 30 46.6	-21-6-57.8	30.2201	30.1856	-29.5172	7.75	2.22	1.000	87.07
13 APR 1993	9090.50	19 30 55.3	-21-6-34.8	30.1348	30.1855	-29.5474	7.74	2.22	1.000	91.95
18 APR 1993	9095.50	19 31 0.5	-21-6-19.6	30.0496	30.1855	-29.3668	7.74	2.23	1.000	96.82
23 APR 1993	9100.50	19 31 2.2	-21-6-12.0	29.9654	30.1854	-28.9822	7.73	2.24	1.000	101.69
28 APR 1993	9105.50	19 31 0.4	-21-6-12.0	29.8826	30.1853	-28.3347	7.73	2.24	1.000	106.57
3 MAY 1993	9110.50	19 30 55.1	-21-6-19.8	29.8019	30.1852	-27.5031	7.72	2.25	1.000	111.44
8 MAY 1993	9115.50	19 30 46.5	-21-6-34.8	29.7239	30.1851	-26.4884	7.71	2.25	1.000	116.32
13 MAY 1993	9120.50	19 30 34.8	-21-6-57.2	29.6491	30.1850	-25.2866	7.71	2.26	1.000	121.19
18 MAY 1993	9125.50	19 30 19.8	-21-7-26.7	29.5781	30.1849	-23.8980	7.70	2.27	1.000	126.07
23 MAY 1993	9130.50	19 30 1.9	-21-8-2.6	29.5113	30.1848	-22.3212	7.70	2.27	1.000	130.96
28 MAY 1993	9135.50	19 29 41.3	-21-8-45.0	29.4493	30.1847	-20.5738	7.69	2.28	1.000	135.84
2 JUN 1993	9140.50	19 29 18.0	-21-9-33.0	29.3926	30.1846	-18.6865	7.69	2.28	1.000	140.73
7 JUN 1993	9145.50	19 28 52.5	-21-10-26.2	29.3415	30.1845	-16.6764	7.69	2.28	1.000	145.61
12 JUN 1993	9150.50	19 28 24.8	-21-11-24.4	29.2964	30.1844	-14.5447	7.68	2.29	1.000	150.50
17 JUN 1993	9155.50	19 27 55.2	-21-12-26.5	29.2576	30.1843	-12.2954	7.68	2.29	1.000	155.39
22 JUN 1993	9160.50	19 27 24.1	-21-13-32.2	29.2255	30.1843	-9.9424	7.68	2.29	1.000	160.28
27 JUN 1993	9165.50	19 26 51.7	-21-14-41.0	29.2003	30.1842	-7.5169	7.68	2.29	1.000	165.18
2 JUL 1993	9170.50	19 26 18.3	-21-15-51.6	29.1821	30.1841	-5.0513	7.67	2.30	1.000	170.07
7 JUL 1993	9175.50	19 25 44.3	-21-17-4.0	29.1711	30.1840	-2.5554	7.67	2.30	1.000	174.94
12 JUL 1993	9180.50	19 25 9.9	-21-18-17.3	29.1674	30.1839	-0.0327	7.67	2.30	1.000	179.31
17 JUL 1993	9185.50	19 24 35.5	-21-19-30.6	29.1709	30.1838	2.5039	7.67	2.30	1.000	-175.16

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1993	9190.50	19 24	1.4	-21-20-43.8	29.1818	30.1837	5.0302	7.67	2.30	1.000	-170.27
27 JUL 1993	9195.50	19 23	27.9	-21-21-55.7	29.2000	30.1836	7.5100	7.68	2.29	1.000	-165.37
1 AUG 1993	9200.50	19 22	55.4	-21-23-5.7	29.2251	30.1835	9.9207	7.68	2.29	1.000	-160.47
6 AUG 1993	9205.50	19 22	24.2	-21-24-13.8	29.2572	30.1834	12.2604	7.68	2.29	1.000	-155.56
11 AUG 1993	9210.50	19 21	54.4	-21-25-18.7	29.2959	30.1833	14.5227	7.68	2.29	1.000	-150.68
16 AUG 1993	9215.50	19 21	26.5	-21-26-20.3	29.3410	30.1832	16.6896	7.69	2.28	1.000	-145.75
21 AUG 1993	9220.50	19 21	0.7	-21-27-18.2	29.3921	30.1831	18.7326	7.69	2.28	1.000	-140.83
26 AUG 1993	9225.50	19 20	37.2	-21-28-11.3	29.4490	30.1830	20.6228	7.69	2.28	1.000	-135.92
31 AUG 1993	9230.50	19 20	16.4	-21-28-59.9	29.5111	30.1829	22.3538	7.70	2.27	1.000	-131.01
5 SEP 1993	9235.50	19 19	58.3	-21-29-43.4	29.5780	30.1829	23.9298	7.70	2.27	1.000	-126.10
10 SEP 1993	9240.50	19 19	43.2	-21-30-21.1	29.6491	30.1828	25.3435	7.71	2.26	1.000	-121.19
15 SEP 1993	9245.50	19 19	31.2	-21-30-53.3	29.7242	30.1827	26.5759	7.71	2.25	1.000	-116.27
20 SEP 1993	9250.50	19 19	22.5	-21-31-19.2	29.8024	30.1826	27.6026	7.72	2.25	1.000	-111.36
25 SEP 1993	9255.50	19 19	17.3	-21-31-38.7	29.8834	30.1825	28.4129	7.73	2.24	1.000	-106.45
30 SEP 1993	9260.50	19 19	15.4	-21-31-52.0	29.9663	30.1824	29.0153	7.73	2.24	1.000	-101.53
5 OCT 1993	9265.50	19 19	17.1	-21-31-58.4	30.0508	30.1823	29.4181	7.74	2.23	1.000	-96.62
10 OCT 1993	9270.50	19 19	22.4	-21-31-58.1	30.1360	30.1822	29.6155	7.74	2.22	1.000	-91.71
15 OCT 1993	9275.50	19 19	31.2	-21-31-51.1	30.2216	30.1821	29.5910	7.75	2.22	1.000	-86.79
20 OCT 1993	9280.50	19 19	43.6	-21-31-36.9	30.3067	30.1820	29.3344	7.76	2.21	1.000	-81.88
25 OCT 1993	9285.50	19 19	59.5	-21-31-16.0	30.3908	30.1819	28.8555	7.76	2.20	1.000	-76.96
30 OCT 1993	9290.50	19 20	18.7	-21-30-48.3	30.4732	30.1818	28.1728	7.77	2.20	1.000	-72.05
4 NOV 1993	9295.50	19 20	41.3	-21-30-13.7	30.5533	30.1817	27.2973	7.77	2.19	1.000	-67.13
9 NOV 1993	9300.50	19 21	7.1	-21-29-32.6	30.6306	30.1816	26.2249	7.78	2.19	1.000	-62.22
14 NOV 1993	9305.50	19 21	35.9	-21-28-44.8	30.7046	30.1815	24.9473	7.78	2.18	1.000	-57.30
19 NOV 1993	9310.50	19 22	7.7	-21-27-50.7	30.7745	30.1814	23.4742	7.79	2.18	1.000	-52.38
24 NOV 1993	9315.50	19 22	42.1	-21-26-50.6	30.8400	30.1813	21.8306	7.79	2.17	1.000	-47.47
29 NOV 1993	9320.50	19 23	19.1	-21-25-44.5	30.9005	30.1813	20.0390	7.80	2.17	1.000	-42.56
4 DEC 1993	9325.50	19 23	58.3	-21-24-33.0	30.9556	30.1812	18.1114	7.80	2.16	1.000	-37.64
9 DEC 1993	9330.50	19 24	39.5	-21-23-16.4	31.0049	30.1811	16.0456	7.81	2.16	1.000	-32.73
14 DEC 1993	9335.50	19 25	22.6	-21-21-54.6	31.0481	30.1810	13.8465	7.81	2.16	1.000	-27.81
19 DEC 1993	9340.50	19 26	7.3	-21-20-28.7	31.0848	30.1809	11.5418	7.81	2.16	1.000	-22.90
24 DEC 1993	9345.50	19 26	53.2	-21-18-58.8	31.1147	30.1808	9.1619	7.81	2.15	1.000	-17.99
29 DEC 1993	9350.50	19 27	40.1	-21-17-25.3	31.1377	30.1807	6.7283	7.82	2.15	1.000	-13.09

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA (MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
3 JAN 1994	9355.50	19 28 27.8	-21-15-49.1	31.1535	30.1808	4.2502	7.82	2.15	1.000	-8.19
8 JAN 1994	9360.50	19 29 16.9	-21-14-10.4	31.1622	30.1805	1.7288	7.82	2.15	1.000	-3.32
13 JAN 1994	9365.50	19 30 4.3	-21-12-29.8	31.1635	30.1804	-0.8165	7.82	2.15	1.000	1.76
18 JAN 1994	9370.50	19 30 52.4	-21-10-48.2	31.1575	30.1803	-3.3502	7.82	2.15	1.000	6.58
23 JAN 1994	9375.50	19 31 40.2	-21-9-5.9	31.1442	30.1802	-5.8455	7.82	2.15	1.000	11.47
28 JAN 1994	9380.50	19 32 27.4	-21-7-23.8	31.1238	30.1801	-8.2876	7.81	2.15	1.000	16.36
2 FEB 1994	9385.50	19 33 13.5	-21-5-42.4	31.0984	30.1800	-10.6727	7.81	2.15	1.000	21.25
7 FEB 1994	9390.50	19 33 58.5	-21-4-2.2	31.0622	30.1799	-12.9946	7.81	2.16	1.000	26.14
12 FEB 1994	9395.50	19 34 42.0	-21-2-24.4	31.0214	30.1798	-15.2247	7.81	2.16	1.000	31.03
17 FEB 1994	9400.50	19 35 23.8	-21 0-49.2	30.9744	30.1797	-17.3314	7.80	2.16	1.000	35.92
22 FEB 1994	9405.50	19 36 3.6	-20-59-17.4	30.9215	30.1796	-19.2990	7.80	2.17	1.000	40.80
27 FEB 1994	9410.50	19 36 41.2	-20-57-49.8	30.8631	30.1795	-21.1231	7.80	2.17	1.000	45.68
4 MAR 1994	9415.50	19 37 16.4	-20-56-28.6	30.7996	30.1794	-22.8054	7.79	2.18	1.000	50.56
9 MAR 1994	9420.50	19 37 49.0	-20-55-8.7	30.7315	30.1793	-24.3339	7.79	2.18	1.000	55.44
14 MAR 1994	9425.50	19 38 18.8	-20-53-56.7	30.6592	30.1792	-25.6808	7.78	2.19	1.000	60.31
19 MAR 1994	9430.50	19 38 45.6	-20-52-50.9	30.5834	30.1791	-26.8271	7.78	2.19	1.000	65.19
24 MAR 1994	9435.50	19 39 9.4	-20-51-52.1	30.5045	30.1790	-27.7712	7.77	2.20	1.000	70.06
29 MAR 1994	9440.50	19 39 29.9	-20-51-0.4	30.4232	30.1790	-28.5211	7.76	2.20	1.000	74.92
3 APR 1994	9445.50	19 39 47.2	-20-50-16.1	30.3399	30.1789	-29.0795	7.76	2.21	1.000	79.79
8 APR 1994	9450.50	19 40 1.1	-20-49-40.0	30.2554	30.1788	-29.4320	7.75	2.21	1.000	84.66
13 APR 1994	9455.50	19 40 11.4	-20-49-11.8	30.1702	30.1787	-29.5606	7.75	2.22	1.000	89.53
18 APR 1994	9460.50	19 40 18.4	-20-48-51.9	30.0849	30.1786	-29.4626	7.74	2.23	1.000	94.40
23 APR 1994	9465.50	19 40 21.8	-20-48-40.6	30.0002	30.1785	-29.1516	7.73	2.23	1.000	99.26
28 APR 1994	9470.50	19 40 21.7	-20-48-37.4	29.9167	30.1784	-28.6437	7.73	2.24	1.000	104.13
3 MAY 1994	9475.50	19 40 18.2	-20-48-42.6	29.8350	30.1783	-27.9392	7.72	2.25	1.000	109.00
8 MAY 1994	9480.50	19 40 11.3	-20-48-56.2	29.7556	30.1782	-27.0279	7.72	2.25	1.000	113.87
13 MAY 1994	9485.50	19 40 1.2	-20-49-17.7	29.6791	30.1781	-25.9068	7.71	2.26	1.000	118.74
18 MAY 1994	9490.50	19 39 47.9	-20-49-47.1	29.6061	30.1780	-24.5893	7.71	2.26	1.000	123.62
23 MAY 1994	9495.50	19 39 31.5	-20-50-23.9	29.5372	30.1779	-23.1016	7.70	2.27	1.000	128.49
28 MAY 1994	9500.50	19 39 12.3	-20-51-7.5	29.4729	30.1778	-21.4607	7.70	2.27	1.000	133.37
2 JUN 1994	9505.50	19 38 50.5	-20-51-58.0	29.4134	30.1777	-19.6650	7.69	2.28	1.000	138.25
7 JUN 1994	9510.50	19 38 26.2	-20-52-54.2	29.3594	30.1776	-17.7147	7.69	2.28	1.000	143.13
12 JUN 1994	9515.50	19 37 59.6	-20-53-56.0	29.3113	30.1775	-15.6219	7.68	2.29	1.000	148.02
17 JUN 1994	9520.50	19 37 31.1	-20-55-2.8	29.2693	30.1774	-13.4135	7.68	2.29	1.000	152.91
22 JUN 1994	9525.50	19 37 0.9	-20-56-13.4	29.2339	30.1773	-11.1211	7.68	2.29	1.000	157.80
27 JUN 1994	9530.50	19 36 29.3	-20-57-27.6	29.2052	30.1772	-8.7560	7.68	2.29	1.000	162.69
2 JUL 1994	9535.50	19 35 56.5	-20-58-44.6	29.1834	30.1771	-6.3185	7.67	2.30	1.000	167.58
7 JUL 1994	9540.50	19 35 22.9	-21 0-3.5	29.1687	30.1770	-3.8209	7.67	2.30	1.000	172.47
12 JUL 1994	9545.50	19 34 48.8	-21 -1-23.9	29.1613	30.1769	-1.2865	7.67	2.30	1.000	177.32
17 JUL 1994	9550.50	19 34 14.5	-21 -2-44.7	29.1613	30.1768	1.2505	7.67	2.30	1.000	-177.62

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1994	9555.50	19 33	40.4	-21 -4 -5.1	29.1685	30.1767	3.7637	7.67	2.30	1.000	-172.77
27 JUL 1994	9560.50	19 33	6.7	-21 -5-24.9	29.1830	30.1766	8.2500	7.67	2.30	1.000	-167.87
1 AUG 1994	9565.50	19 32	33.8	-21 -6-42.9	29.2046	30.1765	8.7041	7.68	2.29	1.000	-162.97
6 AUG 1994	9570.50	19 32	1.9	-21 -7-58.7	29.2332	30.1764	11.1058	7.68	2.29	1.000	-158.06
11 AUG 1994	9575.50	19 31	31.5	-21 -9-11.7	29.2687	30.1763	13.4263	7.68	2.29	1.000	-153.14
16 AUG 1994	9580.50	19 31	2.7	-21 -10-20.8	29.3107	30.1762	15.6345	7.68	2.29	1.000	-148.23
21 AUG 1994	9585.50	19 30	36.0	-21 -11-26.0	29.3588	30.1761	17.7184	7.69	2.28	1.000	-143.32
26 AUG 1994	9590.50	19 30	11.4	-21 -12-26.6	29.4129	30.1760	19.6811	7.69	2.28	1.000	-138.40
31 AUG 1994	9595.50	19 29	49.3	-21 -13-21.8	29.4724	30.1759	21.5133	7.70	2.27	1.000	-133.49
5 SEP 1994	9600.50	19 29	29.8	-21 -14-11.7	29.5370	30.1758	23.1925	7.70	2.27	1.000	-128.57
10 SEP 1994	9605.50	19 29	13.3	-21 -14-55.4	29.6002	30.1757	24.6925	7.71	2.26	1.000	-123.65
15 SEP 1994	9610.50	19 28	59.8	-21 -15-32.7	29.6794	30.1756	25.9965	7.71	2.26	1.000	-118.73
20 SEP 1994	9615.50	19 28	49.5	-21 -16 -3.5	29.7561	30.1755	27.1088	7.72	2.25	1.000	-113.81
25 SEP 1994	9620.50	19 28	42.6	-21 -16-27.1	29.8358	30.1754	28.0355	7.72	2.25	1.000	-108.90
30 SEP 1994	9625.50	19 28	39.0	-21 -16-43.7	29.9179	30.1753	28.7668	7.73	2.24	1.000	-103.98
5 OCT 1994	9630.50	19 28	39.0	-21 -16-53.1	30.0017	30.1752	29.2834	7.73	2.23	1.000	-99.05
10 OCT 1994	9635.50	19 28	42.5	-21 -16-54.6	30.0808	30.1751	29.5703	7.74	2.23	1.000	-94.13
15 OCT 1994	9640.50	19 28	49.6	-21 -16-48.8	30.1723	30.1750	29.6312	7.75	2.22	1.000	-89.21
20 OCT 1994	9645.50	19 29	0.2	-21 -16-35.3	30.2577	30.1749	29.4819	7.75	2.21	1.000	-84.29
25 OCT 1994	9650.50	19 29	14.3	-21 -16-14.1	30.3424	30.1748	29.1298	7.76	2.21	1.000	-79.37
30 OCT 1994	9655.50	19 29	31.8	-21 -15-45.4	30.4257	30.1747	28.5680	7.76	2.20	1.000	-74.45
4 NOV 1994	9660.50	19 29	52.7	-21 -15 -9.1	30.5071	30.1746	27.7846	7.77	2.20	1.000	-69.53
9 NOV 1994	9665.50	19 30	16.9	-21 -14-25.3	30.5860	30.1745	26.7834	7.78	2.19	1.000	-64.61
14 NOV 1994	9670.50	19 30	44.2	-21 -13-34.5	30.6616	30.1744	25.5861	7.78	2.19	1.000	-59.69
19 NOV 1994	9675.50	19 31	14.4	-21 -12-36.4	30.7336	30.1743	24.2130	7.79	2.18	1.000	-54.77
24 NOV 1994	9680.50	19 31	47.5	-21 -11-31.7	30.8013	30.1741	22.6727	7.79	2.18	1.000	-49.85
29 NOV 1994	9685.50	19 32	23.1	-21 -10-20.6	30.8644	30.1740	20.9622	7.80	2.17	1.000	-44.93
4 DEC 1994	9690.50	19 33	1.1	-21 -9 -3.0	30.9222	30.1739	19.0821	7.80	2.17	1.000	-40.01
9 DEC 1994	9695.50	19 33	41.3	-21 -7-39.8	30.9744	30.1738	17.0558	7.80	2.16	1.000	-35.09
14 DEC 1994	9700.50	19 34	23.4	-21 -6-11.3	31.0206	30.1737	14.9137	7.81	2.16	1.000	-30.18
19 DEC 1994	9705.50	19 35	7.1	-21 -4-37.7	31.0605	30.1736	12.6753	7.81	2.16	1.000	-25.26
24 DEC 1994	9710.50	19 35	52.3	-21 -3 0.0	31.0937	30.1735	10.3492	7.81	2.16	1.000	-20.35
29 DEC 1994	9715.50	19 36	38.6	-21 -1-18.2	31.1202	30.1734	7.9367	7.81	2.15	1.000	-15.44

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (^{''})	PHASE	ELONG
3 JAN 1995	9720.50	19 37 25.8	-20-59-33.0	31.1395	30.1733		5.4532	7.81	2.15	1.000	-10.53
8 JAN 1995	9725.50	19 38 13.5	-20-57-45.3	31.1516	30.1732		2.9344	7.82	2.15	1.000	-5.64
13 JAN 1995	9730.50	19 39 1.6	-20-56-56.3	31.1666	30.1731		0.4087	7.82	2.15	1.000	-0.89
18 JAN 1995	9735.50	19 39 49.7	-20-54-4.1	31.1640	30.1730		-2.1097	7.82	2.15	1.000	4.23
23 JAN 1995	9740.50	19 40 37.5	-20-52-12.2	31.1443	30.1729		-4.6143	7.81	2.15	1.000	9.11
28 JAN 1995	9745.50	19 41 24.8	-20-50-19.9	31.1274	30.1728		-7.0989	7.81	2.15	1.000	14.00
2 FEB 1995	9750.50	19 42 11.3	-20-48-28.6	31.1033	30.1727		-9.5365	7.81	2.15	1.000	18.90
7 FEB 1995	9755.50	19 42 56.7	-20-46-38.5	31.0724	30.1726		-11.8915	7.81	2.16	1.000	23.79
12 FEB 1995	9760.50	19 43 40.8	-20-44-50.5	31.0347	30.1725		-14.1458	7.81	2.16	1.000	28.67
17 FEB 1995	9765.50	19 44 23.2	-20-43-5.5	30.9908	30.1724		-16.2933	7.80	2.16	1.000	33.56
22 FEB 1995	9770.50	19 45 3.8	-20-41-23.8	30.9408	30.1723		-18.3317	7.80	2.17	1.000	38.43
27 FEB 1995	9775.50	19 45 42.4	-20-39-46.3	30.8850	30.1721		-20.2491	7.80	2.17	1.000	43.31
4 MAR 1995	9780.50	19 46 18.6	-20-38-13.9	30.8239	30.1720		-22.0153	7.79	2.17	1.000	48.19
9 MAR 1995	9785.50	19 46 52.3	-20-36-46.8	30.7580	30.1719		-23.6063	7.79	2.18	1.000	53.06
14 MAR 1995	9790.50	19 47 23.4	-20-35-26.0	30.6878	30.1718		-25.0177	7.78	2.18	1.000	57.93
19 MAR 1995	9795.50	19 47 51.6	-20-34-12.0	30.6137	30.1717		-26.2533	7.78	2.19	1.000	62.80
24 MAR 1995	9800.50	19 48 16.8	-20-33-4.8	30.5363	30.1716		-27.3131	7.77	2.19	1.000	67.68
29 MAR 1995	9805.50	19 48 38.9	-20-32-5.6	30.4562	30.1715		-28.1812	7.77	2.20	1.000	72.53
3 APR 1995	9810.50	19 48 57.7	-20-31-14.4	30.3738	30.1714		-28.8350	7.76	2.21	1.000	77.39
8 APR 1995	9815.50	19 49 13.1	-20-30-31.7	30.2898	30.1713		-29.2672	7.75	2.21	1.000	82.25
13 APR 1995	9820.50	19 49 25.2	-20-29-57.8	30.2049	30.1712		-29.4875	7.75	2.22	1.000	87.11
18 APR 1995	9825.50	19 49 33.8	-20-29-32.6	30.1197	30.1711		-29.5080	7.74	2.22	1.000	91.97
23 APR 1995	9830.50	19 49 39.0	-20-29-16.5	30.0347	30.1710		-29.3274	7.74	2.23	1.000	96.83
28 APR 1995	9835.50	19 49 40.6	-20-29-9.7	29.9505	30.1708		-28.9316	7.73	2.24	1.000	101.70
3 MAY 1995	9840.50	19 49 38.9	-20-29-11.7	29.8678	30.1707		-28.3132	7.72	2.24	1.000	106.56
8 MAY 1995	9845.50	19 49 33.7	-20-29-23.0	29.7872	30.1706		-27.4815	7.72	2.25	1.000	111.43
13 MAY 1995	9850.50	19 49 25.2	-20-29-43.0	29.7093	30.1705		-26.4582	7.71	2.26	1.000	116.29
18 MAY 1995	9855.50	19 49 13.6	-20-30-11.4	29.6348	30.1704		-25.2586	7.71	2.26	1.000	121.16
23 MAY 1995	9860.50	19 48 58.8	-20-30-48.2	29.5636	30.1703		-23.8793	7.70	2.27	1.000	126.03
28 MAY 1995	9865.50	19 48 41.1	-20-31-32.7	29.4969	30.1702		-22.3154	7.70	2.27	1.000	130.90
2 JUN 1995	9870.50	19 48 20.7	-20-32-24.5	29.4349	30.1701		-20.5765	7.69	2.28	1.000	135.78
7 JUN 1995	9875.50	19 47 57.7	-20-33-23.3	29.3782	30.1700		-18.6855	7.69	2.28	1.000	140.66
12 JUN 1995	9880.50	19 47 32.4	-20-34-28.0	29.3271	30.1698		-16.6713	7.68	2.28	1.000	145.54
17 JUN 1995	9885.50	19 47 5.0	-20-35-38.4	29.2820	30.1697		-14.5460	7.68	2.29	1.000	150.42
22 JUN 1995	9890.50	19 46 35.7	-20-36-53.6	29.2432	30.1696		-12.3072	7.68	2.29	1.000	155.31
27 JUN 1995	9895.50	19 46 4.9	-20-38-12.8	29.2110	30.1695		-9.9637	7.68	2.29	1.000	160.20
2 JUL 1995	9900.50	19 45 32.8	-20-39-35.6	29.1857	30.1694		-7.5386	7.67	2.30	1.000	165.09
7 JUL 1995	9905.50	19 44 59.7	-20-41-0.8	29.1675	30.1693		-5.0630	7.67	2.30	1.000	169.98
12 JUL 1995	9910.50	19 44 26.0	-20-42-27.6	29.1565	30.1692		-2.5646	7.67	2.30	1.000	174.87
17 JUL 1995	9915.50	19 43 52.0	-20-43-55.5	29.1527	30.1691		-0.0485	7.67	2.30	1.000	179.41

GEOCENTRIC EPHEMERIS FOR NEPTUNE

DATE	JD (2440000+)	RA	(MEAN)	DEC	DELTA	RHO	RV (K/S)	MAG	SIZE (")	PHASE	ELONG
22 JUL 1995	9920.50	19 43	17.9	-20-45-23.4	29.1562	30.1690	2.4827	7.67	2.30	1.000	-175.26
27 JUL 1995	9925.50	19 42	44.1	-20-46-50.7	29.1671	30.1688	5.0080	7.67	2.30	1.000	-170.37
1 AUG 1995	9930.50	19 42	10.8	-20-48-16.8	29.1851	30.1687	7.4981	7.67	2.30	1.000	-165.46
6 AUG 1995	9935.50	19 41	38.6	-20-49-40.3	29.2103	30.1686	9.9216	7.68	2.29	1.000	-160.55
11 AUG 1995	9940.50	19 41	7.6	-20-51-1.1	29.2423	30.1685	12.2617	7.68	2.29	1.000	-155.64
16 AUG 1995	9945.50	19 40	38.0	-20-52-18.2	29.2810	30.1684	14.5200	7.68	2.29	1.000	-150.72
21 AUG 1995	9950.50	19 40	10.3	-20-53-31.0	29.3261	30.1683	16.6870	7.68	2.28	1.000	-145.81
26 AUG 1995	9955.50	19 39	44.7	-20-54-39.1	29.3773	30.1682	18.7371	7.69	2.28	1.000	-140.88
31 AUG 1995	9960.50	19 39	21.4	-20-55-41.7	29.4342	30.1680	20.6422	7.69	2.28	1.000	-135.96
5 SEP 1995	9965.50	19 39	0.7	-20-56-38.1	29.4964	30.1679	22.3814	7.70	2.27	1.000	-131.04
10 SEP 1995	9970.50	19 38	42.8	-20-57-28.3	29.5633	30.1678	23.9535	7.70	2.27	1.000	-126.12
15 SEP 1995	9975.50	19 38	27.8	-20-58-11.5	29.6345	30.1677	25.3633	7.71	2.26	1.000	-121.20
20 SEP 1995	9980.50	19 38	16.0	-20-58-47.6	29.7098	30.1676	26.5979	7.71	2.26	1.000	-116.27
25 SEP 1995	9985.50	19 38	7.3	-20-59-16.2	29.7880	30.1675	27.6342	7.72	2.25	1.000	-111.35
30 SEP 1995	9990.50	19 38	2.1	-20-59-36.8	29.8690	30.1673	28.4535	7.72	2.24	1.000	-106.42
5 OCT 1995	9995.50	19 38	0.4	-20-59-49.5	29.9521	30.1672	29.0536	7.73	2.24	1.000	-101.50
10 OCT 1995	10000.50	19 38	2.1	-20-59-53.9	30.0366	30.1671	29.4463	7.74	2.23	1.000	-96.57
15 OCT 1995	10005.50	19 38	7.4	-20-59-50.0	30.1220	30.1670	29.6367	7.74	2.22	1.000	-91.65
20 OCT 1995	10010.50	19 38	16.2	-20-59-37.9	30.2076	30.1669	29.6138	7.75	2.22	1.000	-86.72
25 OCT 1995	10015.50	19 38	28.5	-20-59-17.3	30.2928	30.1668	29.3625	7.75	2.21	1.000	-81.79
30 OCT 1995	10020.50	19 38	44.4	-20-58-48.2	30.3769	30.1666	28.8808	7.76	2.21	1.000	-76.86
4 NOV 1995	10025.50	19 39	3.6	-20-58-11.1	30.4594	30.1665	28.1856	7.77	2.20	1.000	-71.94
9 NOV 1995	10030.50	19 39	26.1	-20-57-25.6	30.5395	30.1664	27.2953	7.77	2.19	1.000	-67.01
14 NOV 1995	10035.50	19 39	51.8	-20-56-32.2	30.6168	30.1663	26.2149	7.78	2.19	1.000	-62.09
19 NOV 1995	10040.50	19 40	20.5	-20-55-31.2	30.6907	30.1662	24.9389	7.78	2.18	1.000	-57.16
24 NOV 1995	10045.50	19 40	52.1	-20-54-22.4	30.7607	30.1661	23.4643	7.79	2.18	1.000	-52.24
29 NOV 1995	10050.50	19 41	26.4	-20-53-6.7	30.8261	30.1659	21.8089	7.79	2.17	1.000	-47.31
4 DEC 1995	10055.50	19 42	3.1	-20-51-44.1	30.8865	30.1658	20.0020	7.80	2.17	1.000	-42.39
9 DEC 1995	10060.50	19 42	42.1	-20-50-15.0	30.9415	30.1657	18.0614	7.80	2.17	1.000	-37.47
14 DEC 1995	10065.50	19 43	23.1	-20-48-40.2	30.9907	30.1656	15.9933	7.80	2.16	1.000	-32.55
19 DEC 1995	10070.50	19 44	5.8	-20-46-59.8	31.0337	30.1655	13.7986	7.81	2.16	1.000	-27.63
24 DEC 1995	10075.50	19 44	50.2	-20-45-14.3	31.0703	30.1653	11.4888	7.81	2.16	1.000	-22.71
29 DEC 1995	10080.50	19 45	35.8	-20-43-24.7	31.1000	30.1652	9.0973	7.81	2.15	1.000	-17.80

TEN YEAR PLANETARY EPHEMERIS : 1986-1995

SECTION 3 : Phases of the Moon

Times listed for lunar phases are in Greenwich Mean Time (GMT).

PHASES OF THE MOON

YEAR	NEW MOON	FIRST QUARTER	FULL MOON	LAST QUARTER
1986	JAN 10 12:23	JAN 17 22:13	JAN 26 0:32	JAN 3 19:47
	FEB 9 0:57	FEB 16 19:54	FEB 24 15:3	FEB 2 4:41
	MAR 10 14:53	MAR 18 16:38	MAR 26 3:3	MAR 3 12:18
	APR 9 6:9	APR 17 10:34	APR 24 12:47	APR 1 19:30
	MAY 8 22:10	MAY 17 0:59	MAY 23 20:44	MAY 1 3:22
	JUN 7 14:1	JUN 15 11:59	JUN 22 3:41	MAY 30 12:54
	JUL 4 4:54	JUL 12 20:9	JUL 21 10:39	JUN 29 0:53
	AUG 5 18:34	AUG 13 2:21	AUG 19 18:53	JUL 28 15:33
	SEP 4 7:8	SEP 11 7:41	SEP 18 5:32	AUG 27 8:38
	OCT 3 18:53	OCT 10 13:29	OCT 17 19:20	SEP 26 3:17
	NOV 2 6:0	NOV 8 21:11	NOV 16 12:11	OCT 25 22:28
	DEC 1 16:42	DEC 8 8:1	DEC 16 7:5	NOV 24 16:52
1987	DEC 31 3:10			DEC 24 9:18
	JAN 29 13:46	JAN 6 22:34	JAN 15 2:31	JAN 22 22:46
	FEB 28 0:52	FEB 5 16:19	FEB 13 20:58	FEB 21 8:56
	MAR 29 12:47	MAR 7 11:57	MAR 15 13:13	MAR 22 16:21
	APR 28 1:35	APR 6 7:47	APR 14 2:32	APR 20 22:14
	MAY 27 15:13	MAY 6 2:25	MAY 13 12:50	MAY 20 4:1
	JUN 26 5:36	JUN 4 18:52	JUN 11 20:48	JUN 18 11:1
	JUL 25 20:36	JUL 3 8:33	JUL 11 3:32	JUL 17 20:18
	AUG 24 11:57	AUG 2 19:23	AUG 9 10:17	AUG 16 8:24
	SEP 23 3:6	SEP 1 3:47	SEP 7 18:12	SEP 14 23:44
	OCT 22 17:26	SEP 30 10:38	OCT 7 4:11	OCT 14 18:6
	NOV 21 6:31	OCT 29 17:10	NOV 5 16:45	NOV 13 14:39
1988	DEC 20 18:24	NOV 28 0:37	DEC 5 8:0	DEC 13 11:42
	JAN 19 5:25	DEC 27 10:1		
	FEB 17 15:55	JAN 25 21:53	JAN 4 1:40	JAN 12 7:4
	MAR 18 2:3	FEB 24 12:14	FEB 2 20:51	FEB 10 23:1
	APR 16 12:1	MAR 25 4:41	MAR 5 16:1	MAR 11 10:56
	MAY 15 22:11	APR 23 22:32	APR 2 9:22	APR 9 19:20
	JUN 14 9:14	MAY 23 16:48	MAY 1 23:42	MAY 9 1:22
	JUL 13 21:53	JUN 22 10:22	MAY 31 10:54	JUN 7 6:21
	AUG 12 12:30	JUL 22 2:13	JUN 29 3:26	JUL 6 11:36
	SEP 11 4:48	AUG 20 15:51	AUG 27 10:56	AUG 4 18:23
	OCT 10 21:47	SEP 19 3:17	SEP 25 19:8	SEP 3 3:51
	NOV 9 14:18	OCT 18 13:0	OCT 25 4:34	OCT 2 16:58
		NOV 16 21:34	NOV 23 15:52	NOV 1 10:11
		DEC 16 5:40	DEC 23 5:27	DEC 1 6:49
				DEC 31 4:56

PHASES OF THE MOON

YEAR	PHASES OF THE MOON			
	NEW MOON	FIRST QUARTER	FULL MOON	LAST QUARTER
1989	JAN 7 19:21	JAN 14 13:58	JAN 21 21:32	JAN 30 2: 2
	FEB 6 7:36	FEB 12 23:15	FEB 20 15:31	FEB 28 20: 8
	MAR 7 18:19	MAR 14 10:11	MAR 22 9:57	MAR 30 10:21
	APR 6 3:33	APR 12 23:13	APR 21 3:14	APR 28 20:46
	MAY 5 11:47	MAY 12 14:19	MAY 20 18:17	MAY 28 4: 1
	JUN 3 19:53	JUN 11 6:58	JUN 19 6:58	JUN 26 9: 9
	JUL 3 4:59	JUL 11 0:18	JUL 18 17:42	JUL 25 13:32
	AUG 1 16: 5	AUG 9 17:28	AUG 17 3: 7	AUG 23 18:41
	AUG 31 5:44	SEP 8 9:49	SEP 15 11:51	SEP 22 2:10
	SEP 29 21:46	OCT 6 0:52	OCT 14 20:32	OCT 21 13:19
	OCT 29 15:26	NOV 6 14:10	NOV 13 5:51	NOV 20 4:43
	NOV 28 9:40	DEC 6 1:25	DEC 12 16:29	DEC 19 23:54
1990	DEC 28 3:19			
	JAN 26 19:19	JAN 4 10:40	JAN 11 4:56	JAN 18 21:17
	FEB 25 8:54	FEB 2 18:32	FEB 9 19:15	FEB 17 18:48
	MAR 26 19:49	MAR 4 2: 5	MAR 11 10:58	MAR 19 14:32
	APR 25 4:28	APR 2 10:24	APR 10 3:18	APR 18 7: 3
	MAY 24 11:47	MAY 1 20:17	MAY 9 19:30	MAY 17 19:45
	JUN 22 18:54	JUN 31 8: 9	JUN 8 11: 0	JUN 16 4:47
	JUL 22 2:53	JUL 29 22: 5	JUL 6 1:23	JUL 13 11: 3
	AUG 20 12:38	AUG 28 14: 0	AUG 5 14:19	AUG 13 15:54
	SEP 19 0:45	SEP 27 7:33	SEP 4 1:45	SEP 11 20:53
	OCT 18 15:35	OCT 26 2: 5	OCT 3 12: 1	OCT 11 3:31
	NOV 17 9: 4	NOV 25 20:25	NOV 2 21:48	NOV 9 13: 2
1991	DEC 17 4:21	DEC 25 13:10	DEC 2 7:50	DEC 9 2: 4
	JAN 15 23:49	JAN 23 14:20	JAN 30 6: 9	JAN 7 18:35
	FEB 14 17:32	FEB 21 22:57	FEB 28 18:24	FEB 6 13:53
	MAR 16 8:11	MAR 23 6: 2	MAR 30 7:16	MAR 8 10:33
	APR 14 19:38	APR 21 12:38	APR 28 20:57	APR 7 6:46
	MAY 14 4:36	MAY 20 19:45	MAY 28 11:36	MAY 7 0:47
	JUN 12 12: 6	JUN 19 4:19	JUN 27 2:58	JUN 5 15:30
	JUL 11 19: 5	JUL 18 15:10	JUL 26 18:24	JUL 5 2:50
	AUG 10 2:27	AUG 17 4:59	AUG 25 9: 7	AUG 3 11:25
	SEP 8 10:59	SEP 15 22: 0	SEP 23 22:40	SEP 1 18:16
	OCT 7 21:37	OCT 15 17:31	OCT 23 11: 8	OCT 1 0:29
	NOV 6 11: 9	NOV 14 13:59	NOV 21 22:56	NOV 30 7:11
	DEC 6 3:55	DEC 14 9:30	DEC 21 10:23	DEC 28 15:22

PHASES OF THE MOON

YEAR	PHASES OF THE MOON			
	NEW MOON	FIRST QUARTER	FULL MOON	LAST QUARTER
1992	JAN 4 23: 9	JAN 13 2:31	JAN 19 21:27	JAN 26 16:27
	FEB 3 18:59	FEB 11 16:13	FEB 18 8: 3	FEB 25 7:56
	MAR 4 13:22	MAR 12 2:34	MAR 18 18:16	MAR 26 2:30
	APR 3 5: 2	APR 10 10: 5	APR 17 4:41	APR 24 21:39
	MAY 2 17:44	MAY 9 15:43	MAY 16 16: 1	MAY 24 15:53
	JUN 1 3:56	JUN 7 20:47	JUN 15 4:49	JUN 23 8:12
	JUN 30 12:18	JUL 7 2:43	JUL 14 19: 6	JUL 22 22:13
	JUL 29 19:35	AUG 5 10:58	AUG 13 10:27	AUG 21 10: 2
	AUG 28 2:41	SEP 3 22:37	SEP 12 2:17	SEP 19 19:53
	SEP 26 10:39	OCT 3 14:10	OCT 11 18: 3	OCT 19 4:12
	OCT 25 20:33	NOV 2 9: 9	NOV 10 9:20	NOV 17 11:39
	NOV 24 9:10	DEC 2 6:15	DEC 9 23:40	DEC 16 19:13
	DEC 24 0:42			
1993	JAN 22 18:27	JAN 1 3:38	JAN 8 12:37	JAN 15 4: 1
	FEB 21 13: 5	JAN 30 23:20	FEB 6 23:55	FEB 13 14:57
	MAR 23 7:14	MAR 1 16:46	MAR 8 9:45	MAR 15 4:16
	APR 21 23:49	APR 31 4: 9	APR 6 18:42	APR 13 19:38
	MAY 21 14: 6	APR 29 12:39	MAY 6 3:33	MAY 13 12:19
	JUN 20 1:52	MAY 28 18:20	JUN 4 13: 1	JUN 12 5:38
	JUL 19 11:23	JUN 26 22:43	JUL 3 23:44	JUL 11 22:50
	AUG 17 19:27	JUL 28 3:24	AUG 2 12: 9	AUG 10 15:20
	SEP 16 3: 9	AUG 24 9:57	SEP 1 2:32	SEP 9 6:26
	OCT 15 11:35	SEP 22 19:31	SEP 30 18:53	OCT 8 19:34
	NOV 13 21:33	OCT 22 8:50	OCT 30 12:37	NOV 7 6:35
	DEC 13 9:26	NOV 21 2: 1	NOV 29 6:30	DEC 6 15:48
1994	JAN 11 23:10	DEC 20 22:25	DEC 28 23: 5	
	FEB 10 14:30	JAN 19 20:26	JAN 27 13:23	JAN 5 0: 0
	MAR 12 7: 5	FEB 18 17:47	FEB 26 1:15	FEB 3 8: 6
	APR 11 0:17	MAR 20 12:14	MAR 27 11:10	MAR 4 16:53
	MAY 10 17: 7	APR 19 2:33	APR 25 19:44	APR 3 2:55
	JUN 9 8:26	MAY 18 12:48	MAY 25 3:38	MAY 2 14:32
	JUL 8 21:36	JUN 16 19:55	JUN 23 11:31	JUN 1 4: 2
	AUG 7 8:44	JUL 16 1:11	JUL 22 20:14	JUN 30 19:31
	SEP 5 18:31	AUG 14 5:57	AUG 21 6:45	JUL 30 12:40
	OCT 5 3:54	SEP 12 11:34	SEP 19 19:59	AUG 29 6:40
	NOV 3 13:34	OCT 11 19:17	OCT 19 12:17	SEP 28 0:23
	DEC 2 23:53	NOV 10 6:13	NOV 18 6:57	OCT 27 16:44
		DEC 9 21: 5	DEC 18 2:17	NOV 26 7: 3
				DEC 25 19: 6

PHASES OF THE MOON

YEAR	PHASES OF THE MOON			
	NEW MOON	FIRST QUARTER	FULL MOON	LAST QUARTER
1995	JAN 1 10:55	JAN 8 15:45	JAN 16 20:28	JAN 24 4:57
	JAN 30 22:48	FEB 7 12:52	FEB 15 12:16	FEB 22 13:3
	MAR 1 11:48	MAR 9 10:12	MAR 17 1:26	MAR 23 20:10
	MAR 31 2:9	APR 8 5:34	APR 15 12:8	APR 22 3:18
	APR 29 17:37	MAY 7 21:43	MAY 14 20:47	MAY 21 11:35
	MAY 29 9:27	MAY 26 10:24	JUN 13 4:2	JUN 19 22:0
	JUN 28 0:49	JUL 5 20:2	JUL 12 10:48	JUL 19 11:9
	JUL 27 15:12	AUG 4 3:16	AUG 10 18:14	AUG 18 3:3
	AUG 26 4:29	SEP 2 9:3	SEP 9 3:35	SEP 16 21:9
	SEP 24 16:53	OCT 1 14:36	OCT 8 15:50	OCT 16 16:26
	OCT 24 4:34	OCT 30 21:17	NOV 7 7:20	NOV 15 11:41
	NOV 22 15:41	NOV 29 6:28	DEC 7 1:27	DEC 15 5:32
	DEC 22 2:22	DEC 28 19:6		
1996	JAN 20 12:50	JAN 27 11:12	JAN 5 20:51	JAN 13 20:45
	FEB 18 23:31	FEB 26 5:50	FEB 4 15:57	FEB 12 8:36
	MAR 19 10:46	MAR 27 1:29	MAR 5 9:23	MAR 12 17:14
	APR 17 22:50	APR 25 20:40	APR 4 0:8	APR 10 23:35
	MAY 17 11:47	MAY 25 14:13	MAY 3 11:49	MAY 10 5:3
	JUN 16 1:36	JUN 24 5:23	JUN 1 20:47	JUN 8 11:5
	JUL 15 16:15	JUL 23 17:49	JUL 1 3:58	JUL 7 18:55
	AUG 14 7:33	AUG 22 3:36	AUG 30 10:35	AUG 6 5:25
	SEP 12 23:6	SEP 20 11:22	SEP 28 17:52	SEP 4 19:6
	OCT 12 14:13	OCT 19 18:8	OCT 26 14:10	OCT 4 12:4
	NOV 11 4:14	NOV 18 1:8	NOV 25 4:9	NOV 3 7:51
	DEC 10 16:55	DEC 17 9:30	DEC 24 20:40	DEC 3 5:6
1997	JAN 9 4:25	JAN 15 20:1	JAN 23 15:9	JAN 2 1:45
	FEB 7 15:6	FEB 14 8:56	FEB 22 10:25	JAN 31 19:40
	MAR 9 1:15	MAR 16 0:5	MAR 24 4:45	MAR 2 9:37
	APR 7 11:2	APR 14 17:0	APR 22 20:34	MAR 31 19:37
	MAY 6 20:47	MAY 14 10:55	MAY 22 9:15	APR 30 2:36
	JUN 5 7:4	JUN 13 4:52	JUN 20 19:10	MAY 29 7:51
	JUL 4 18:40	JUL 12 21:44	JUL 20 3:22	JUN 27 12:43
	AUG 3 8:14	AUG 11 12:42	AUG 18 10:57	JUL 26 18:29
	SEP 1 23:51	SEP 10 1:31	SEP 18 18:51	AUG 25 2:25
	OCT 1 16:51	OCT 9 12:22	SEP 16 3:45	SEP 23 13:36
	OCT 31 10:0	OCT 28 21:43	OCT 16 14:11	OCT 23 4:49
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	DEC 29 16:58	DEC 7 6:9	DEC 14 2:36	DEC 21 21:43

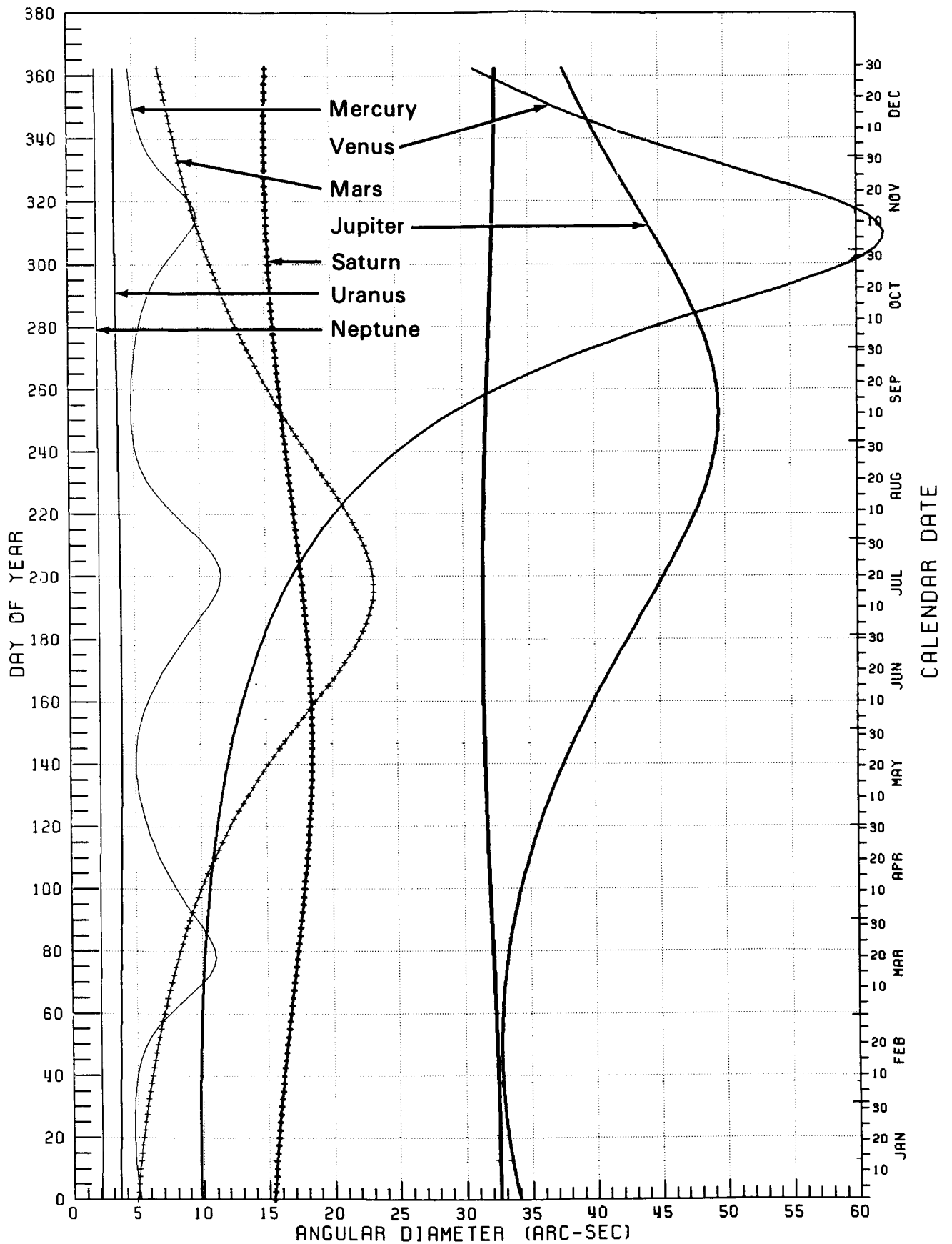
TEN YEAR PLANETARY EPHEMERIS : 1986-1995

SECTION 4 : Graphic Ephemerides - Apparent Angular Diameter

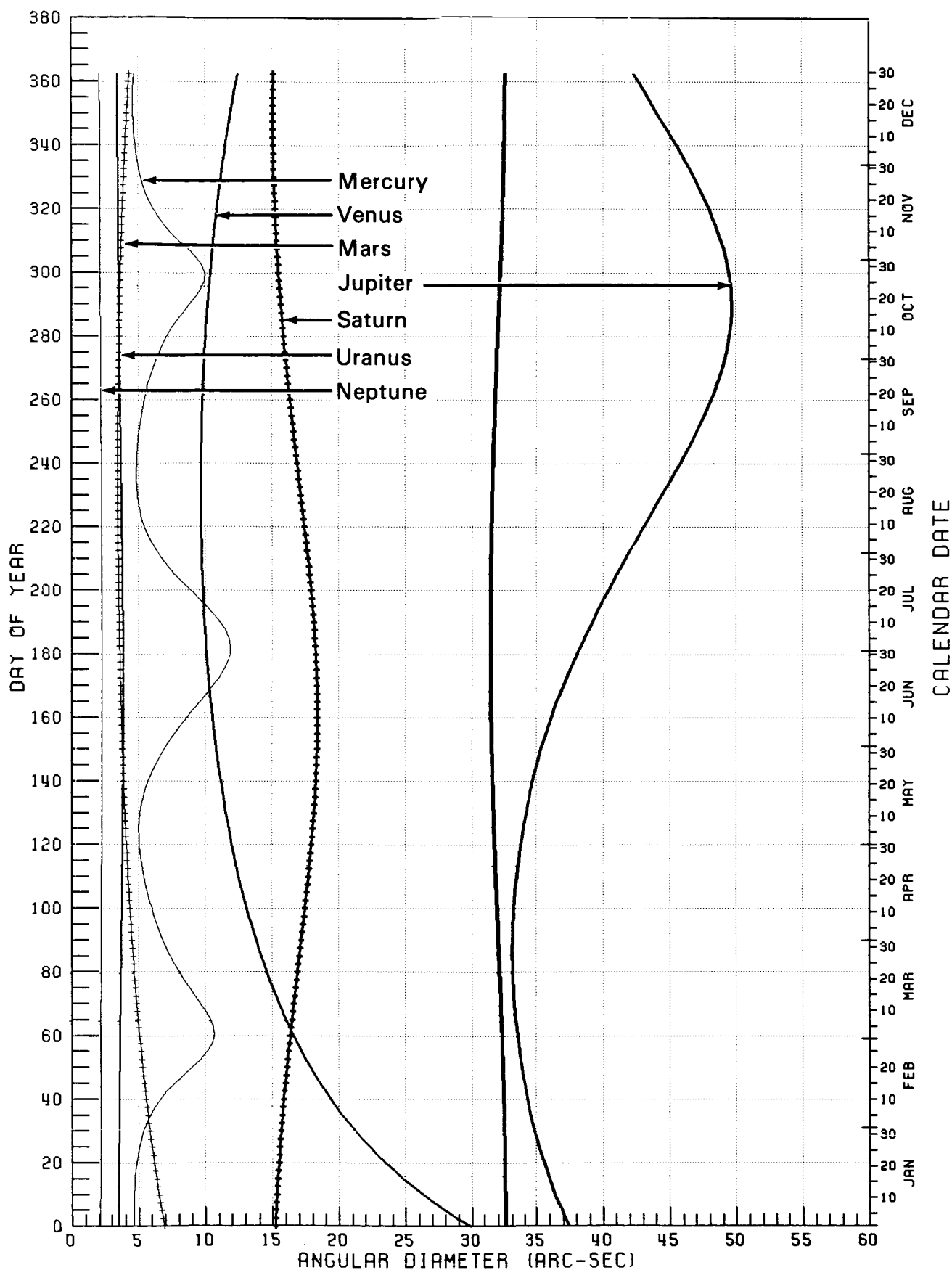
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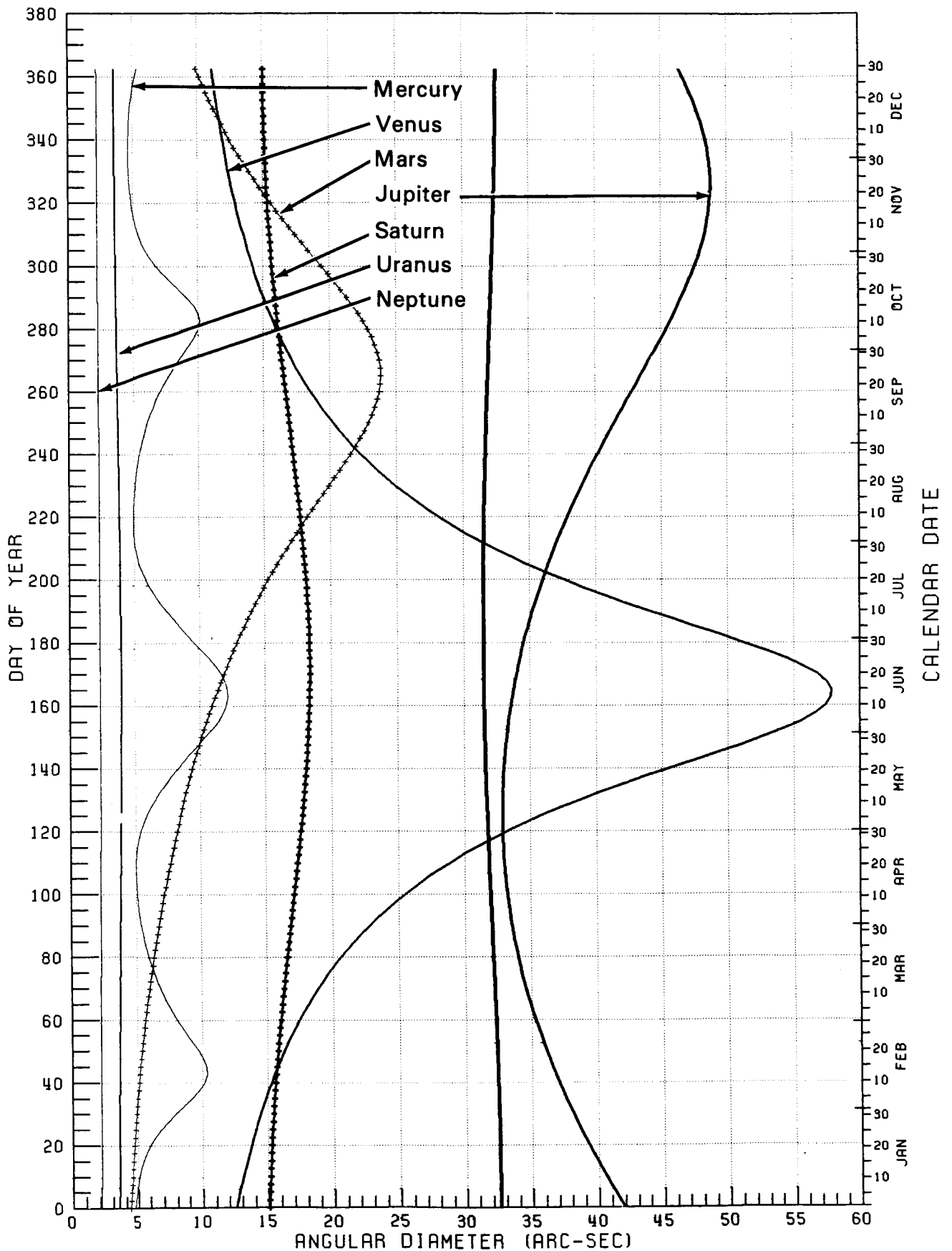
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ANGULAR DIAMETERS OF PLANETS : 1 JAN 1986 - 31 DEC 1986

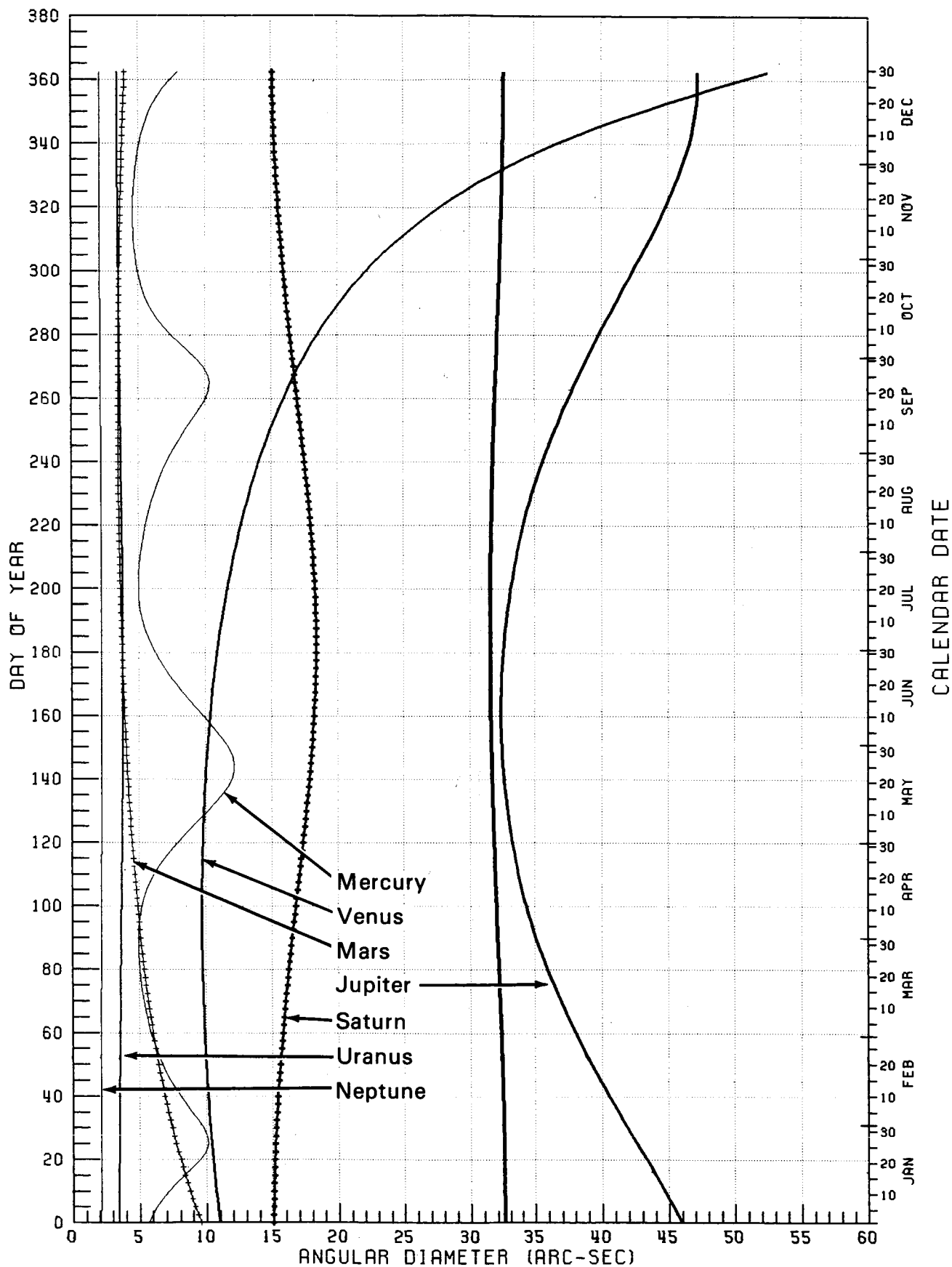


ANGULAR DIAMETERS OF PLANETS : 1 JAN 1987 - 31 DEC 1987

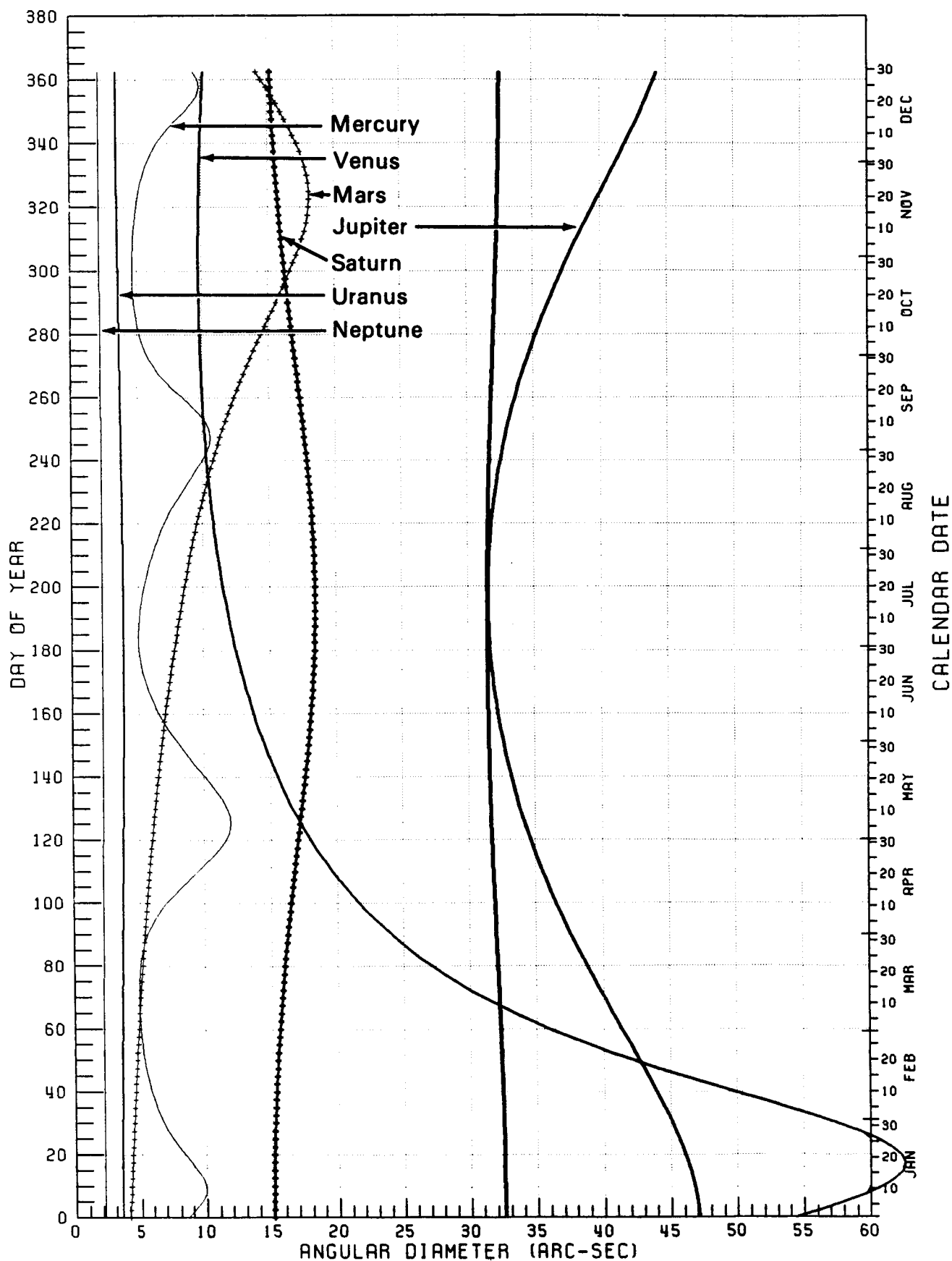




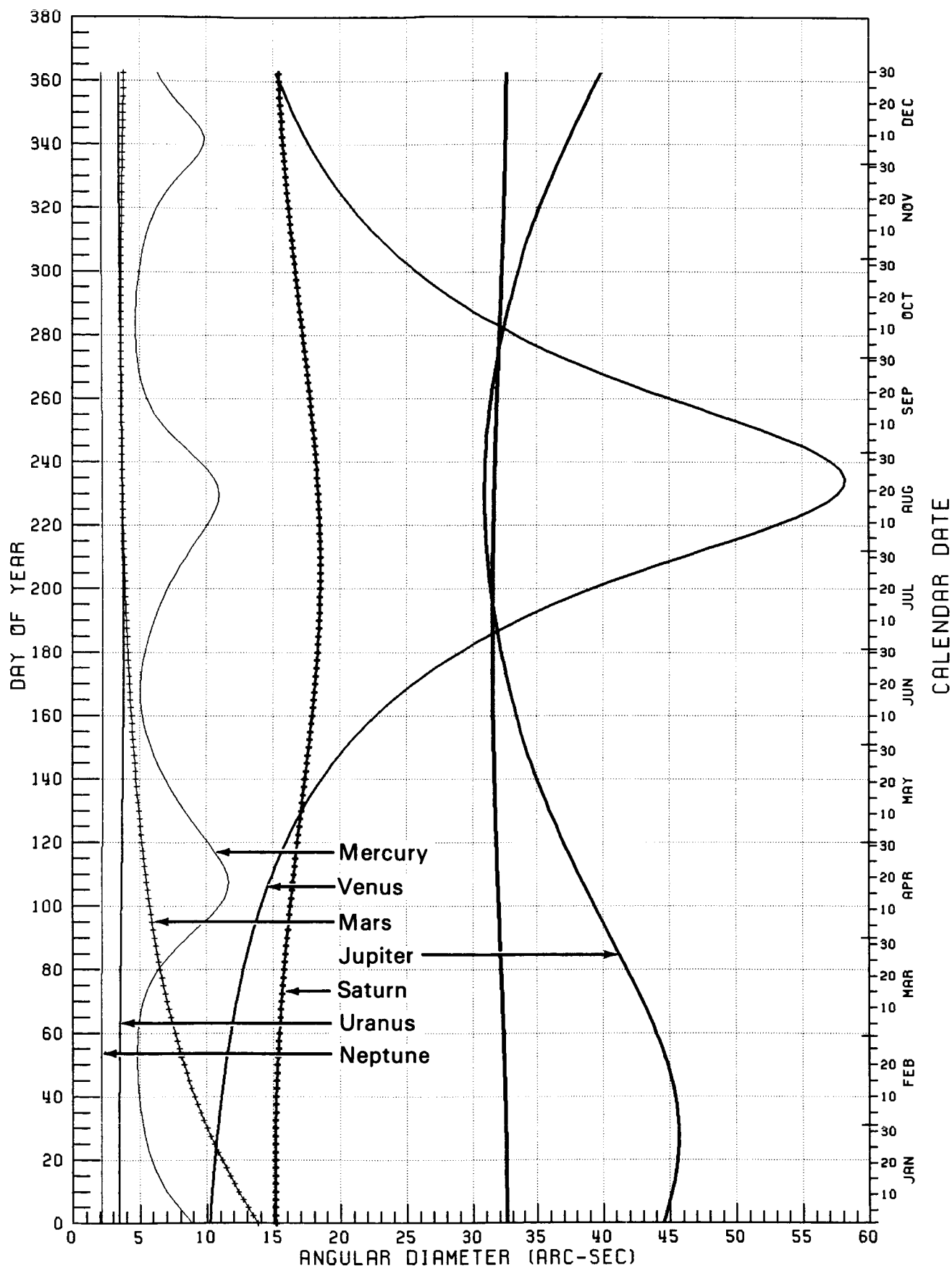
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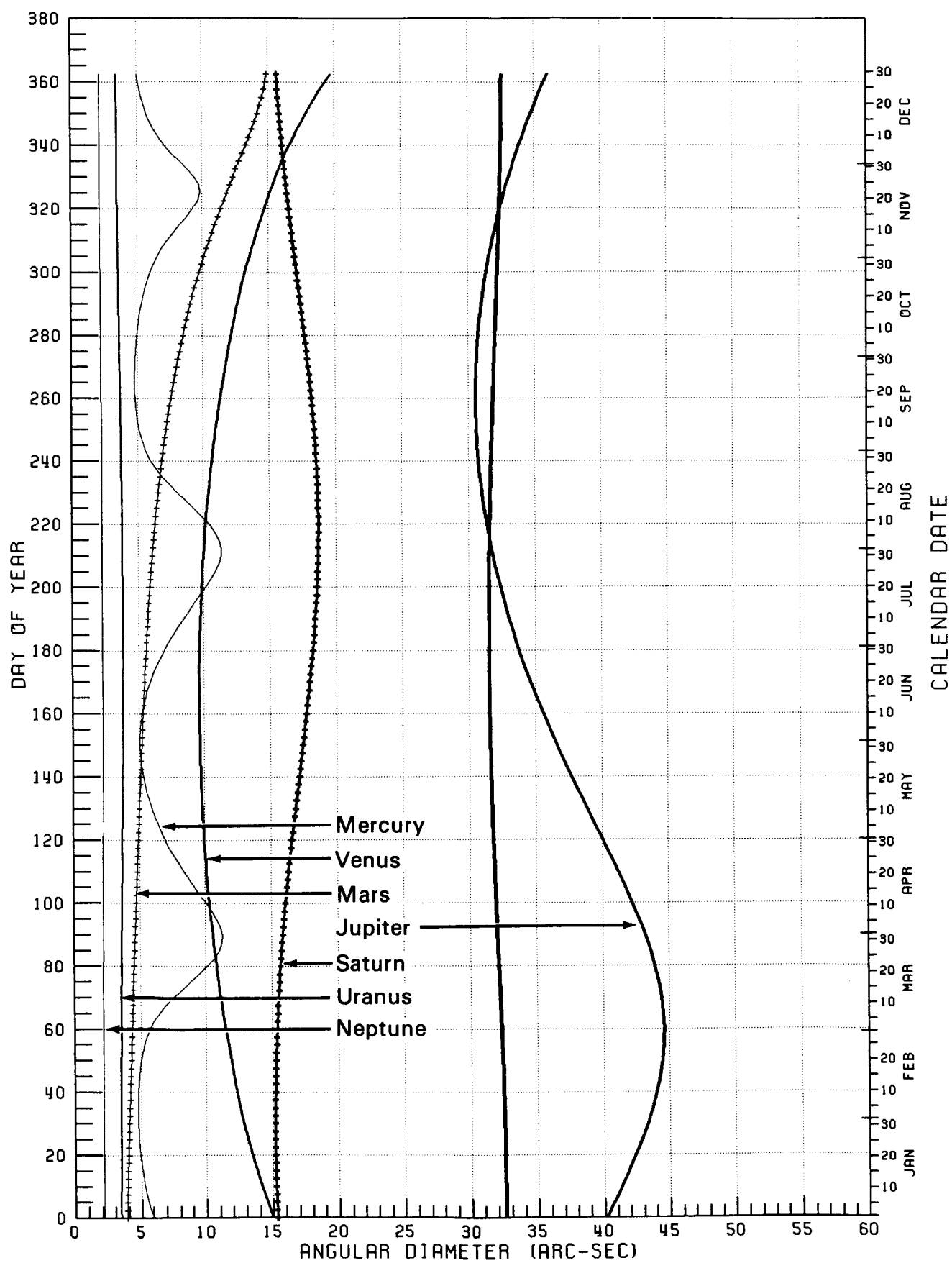
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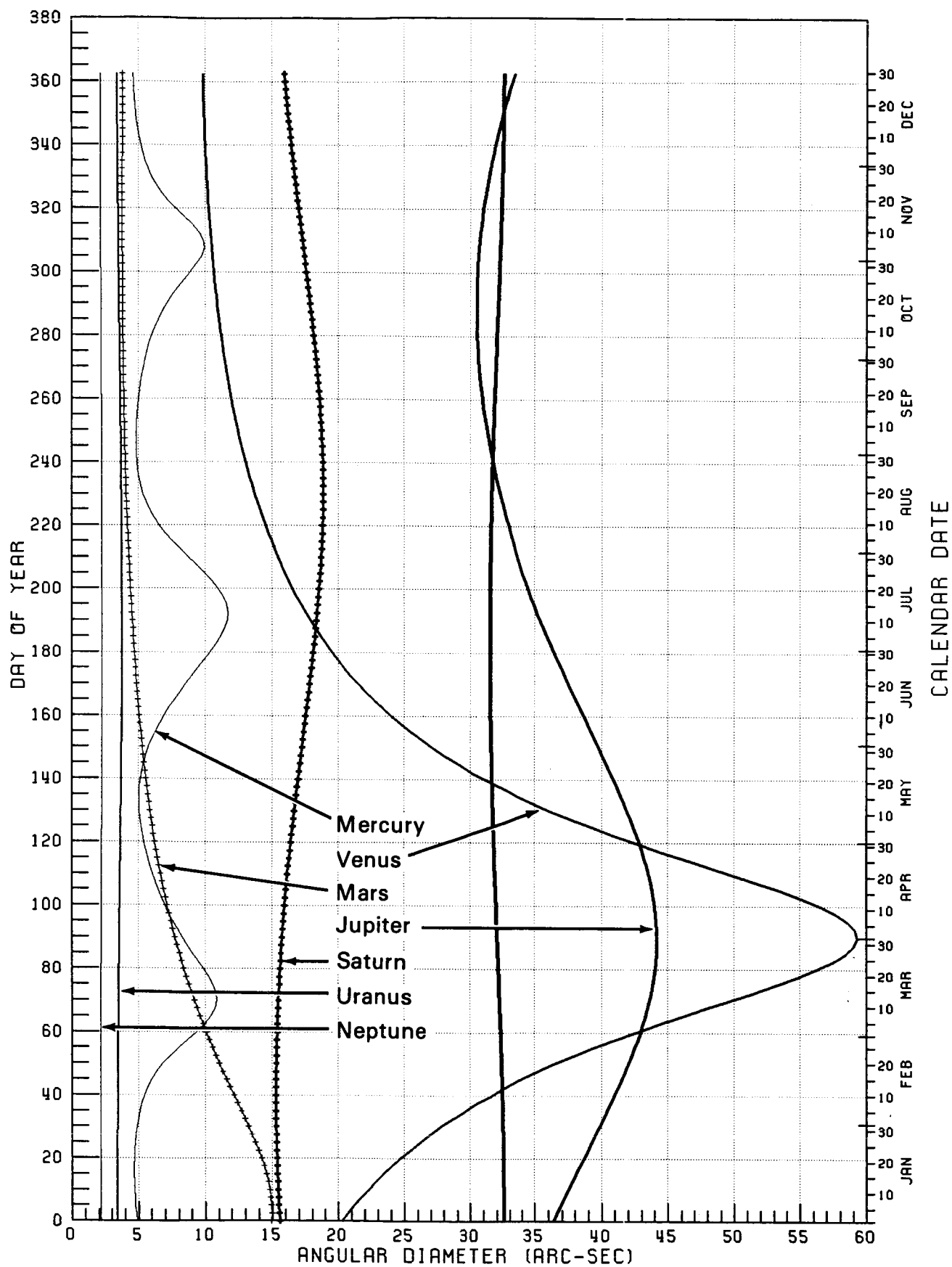
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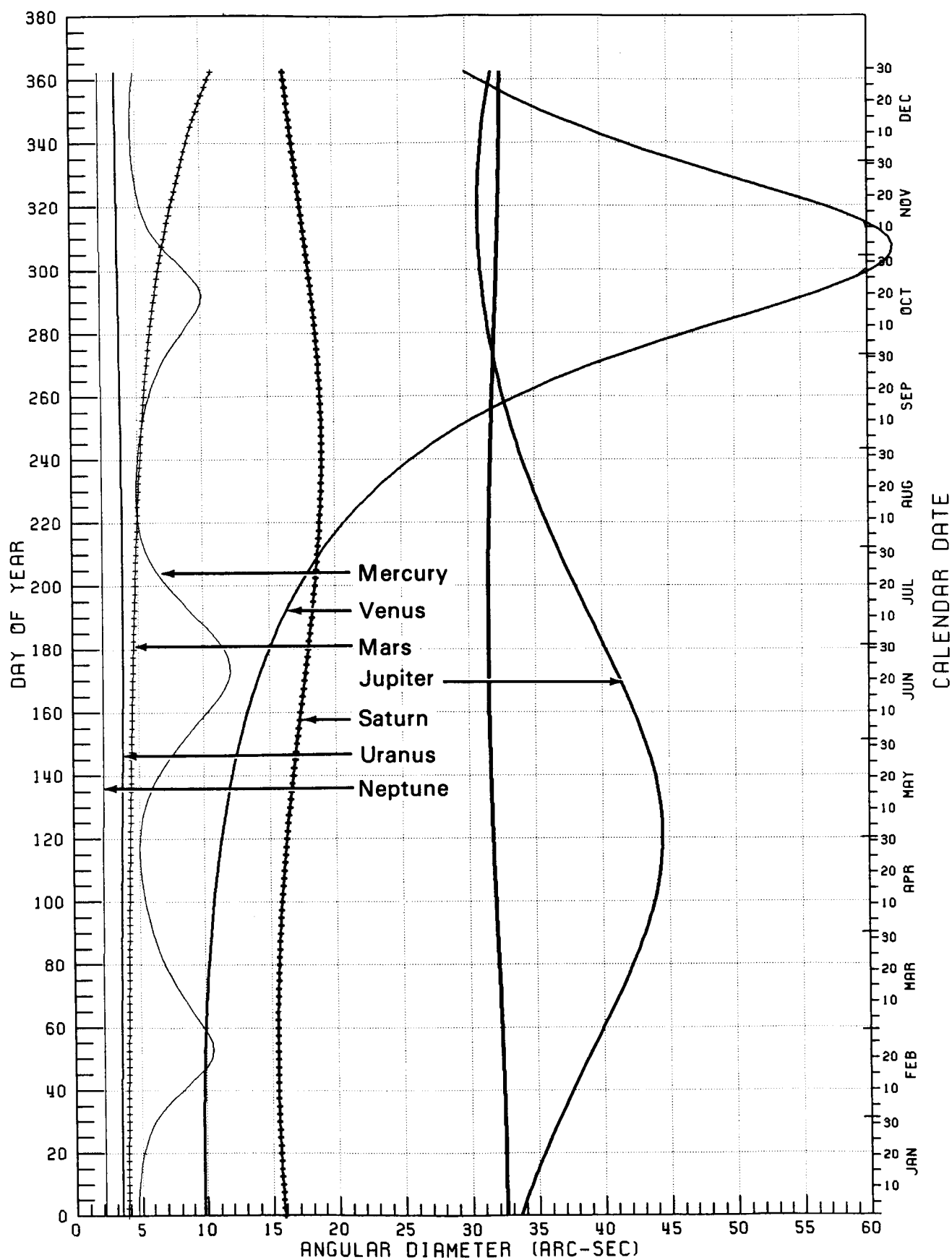


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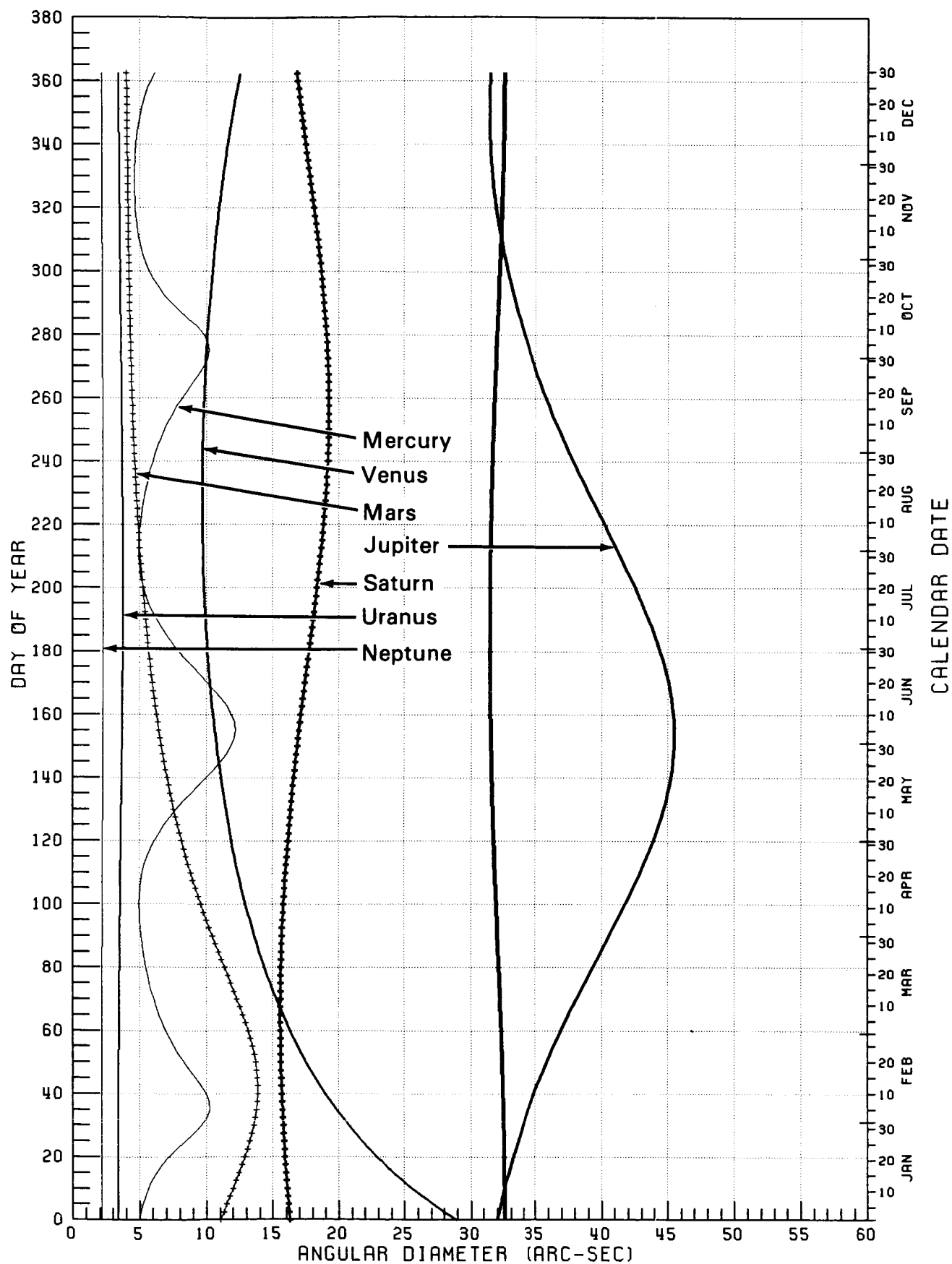


ANGULAR DIAMETERS OF PLANETS : 1 JAN 1993 - 31 DEC 1993





ANGULAR DIAMETERS OF PLANETS : 1 JAN 1995 - 31 DEC 1995

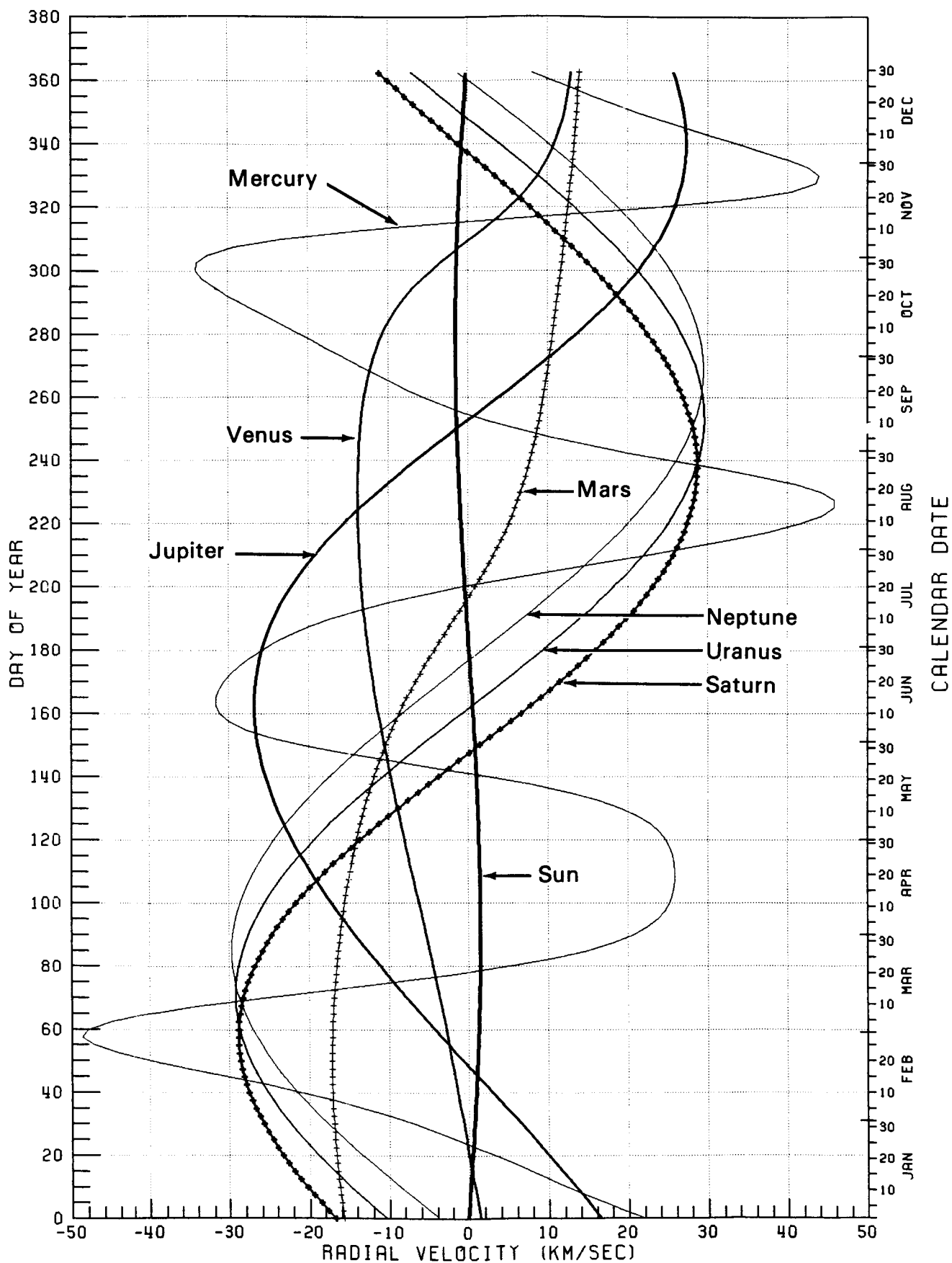


TEN YEAR PLANETARY EPHEMERIS : 1986-1995

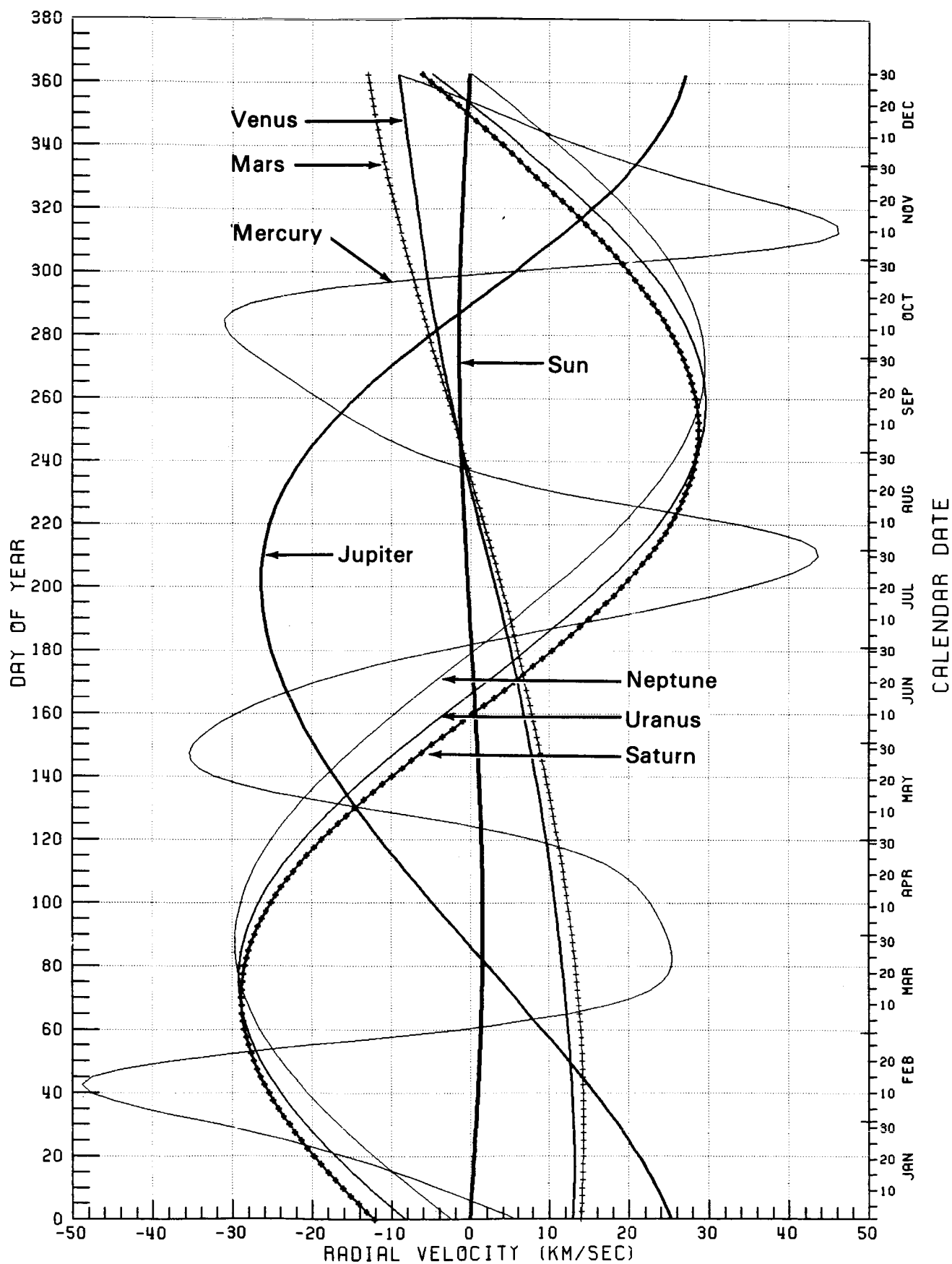
SECTION 5 : Graphic Ephemerides - Radial Velocity

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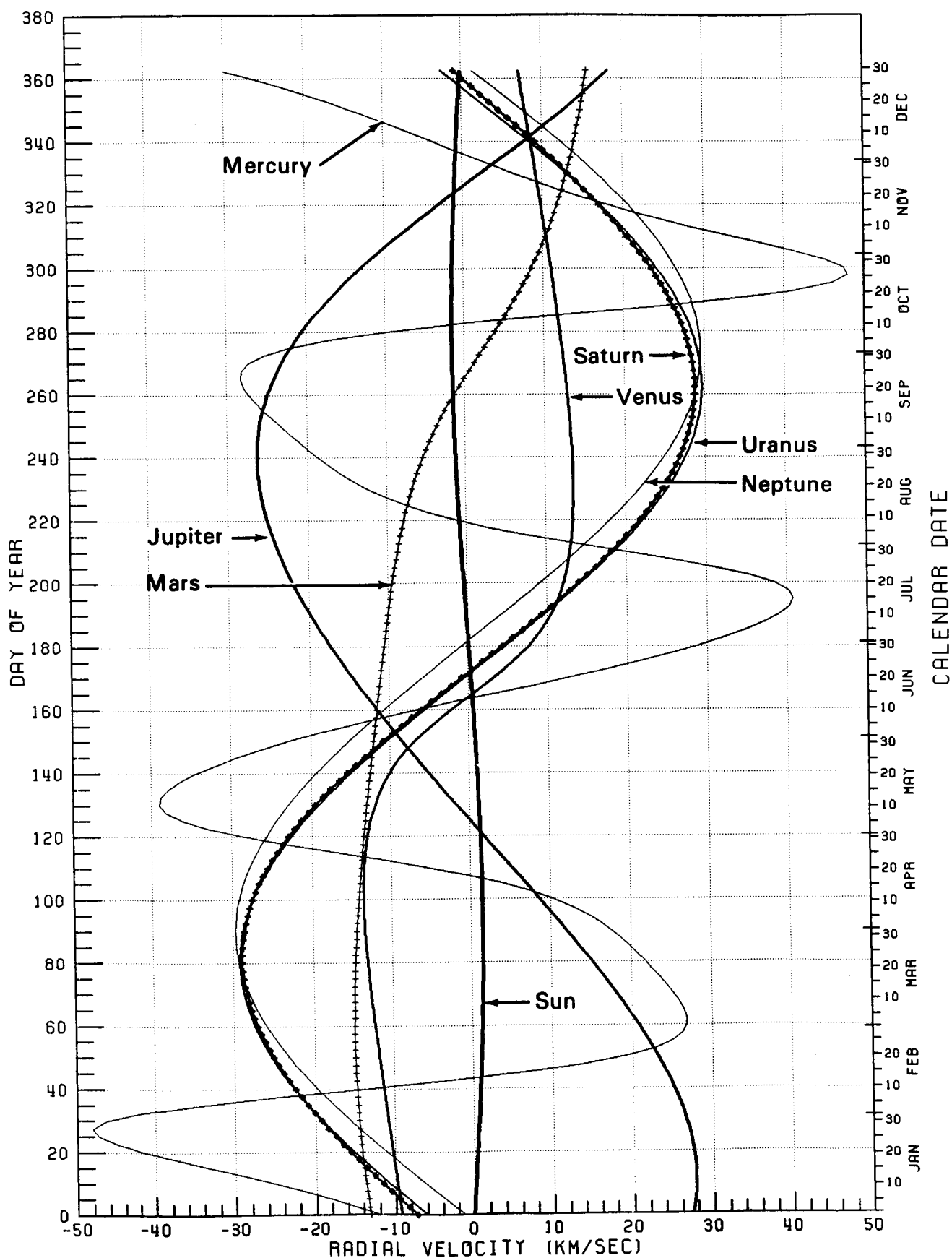
RADIAL VELOCITY OF PLANETS : 1 JAN 1986 - 31 DEC 1986



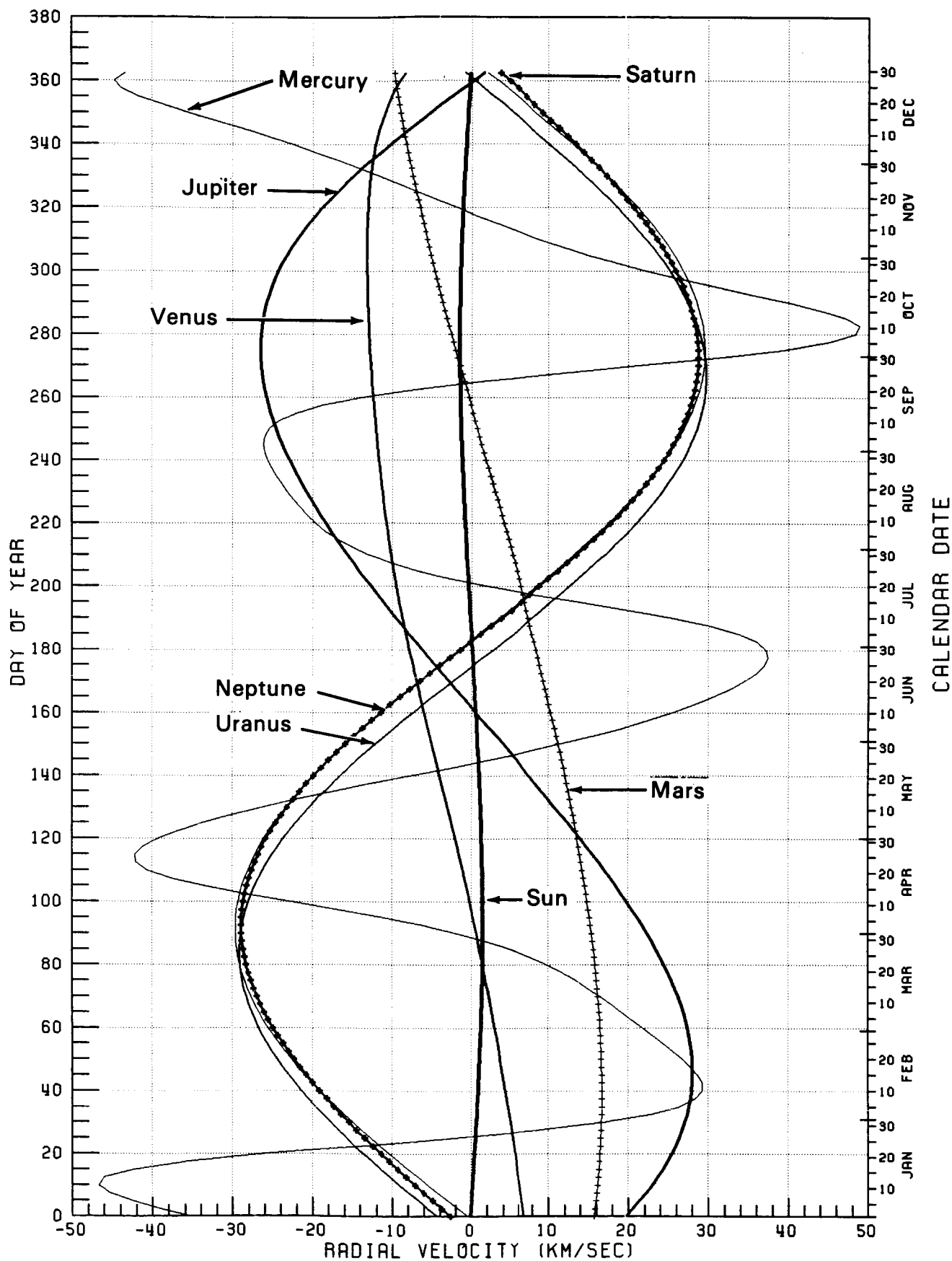
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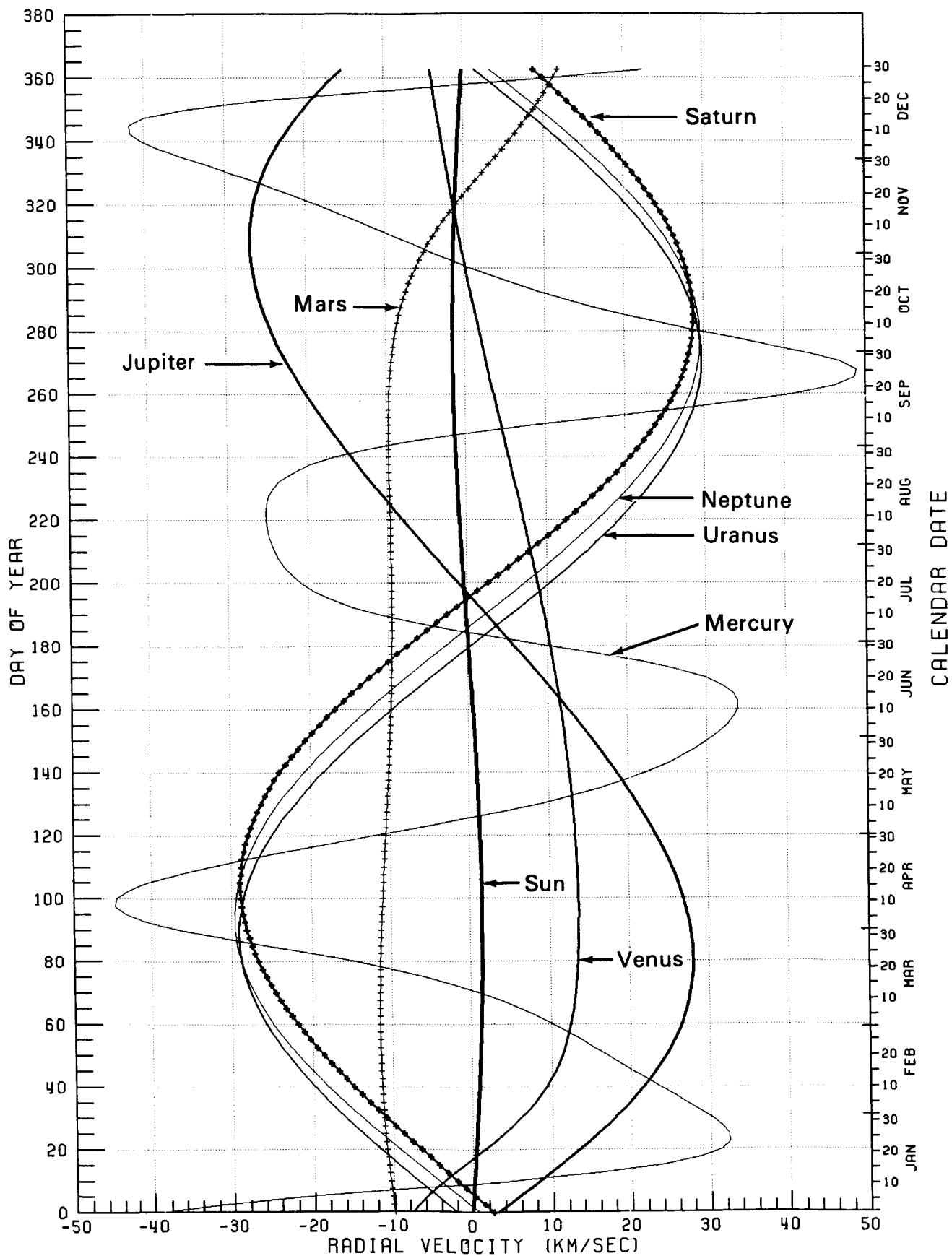
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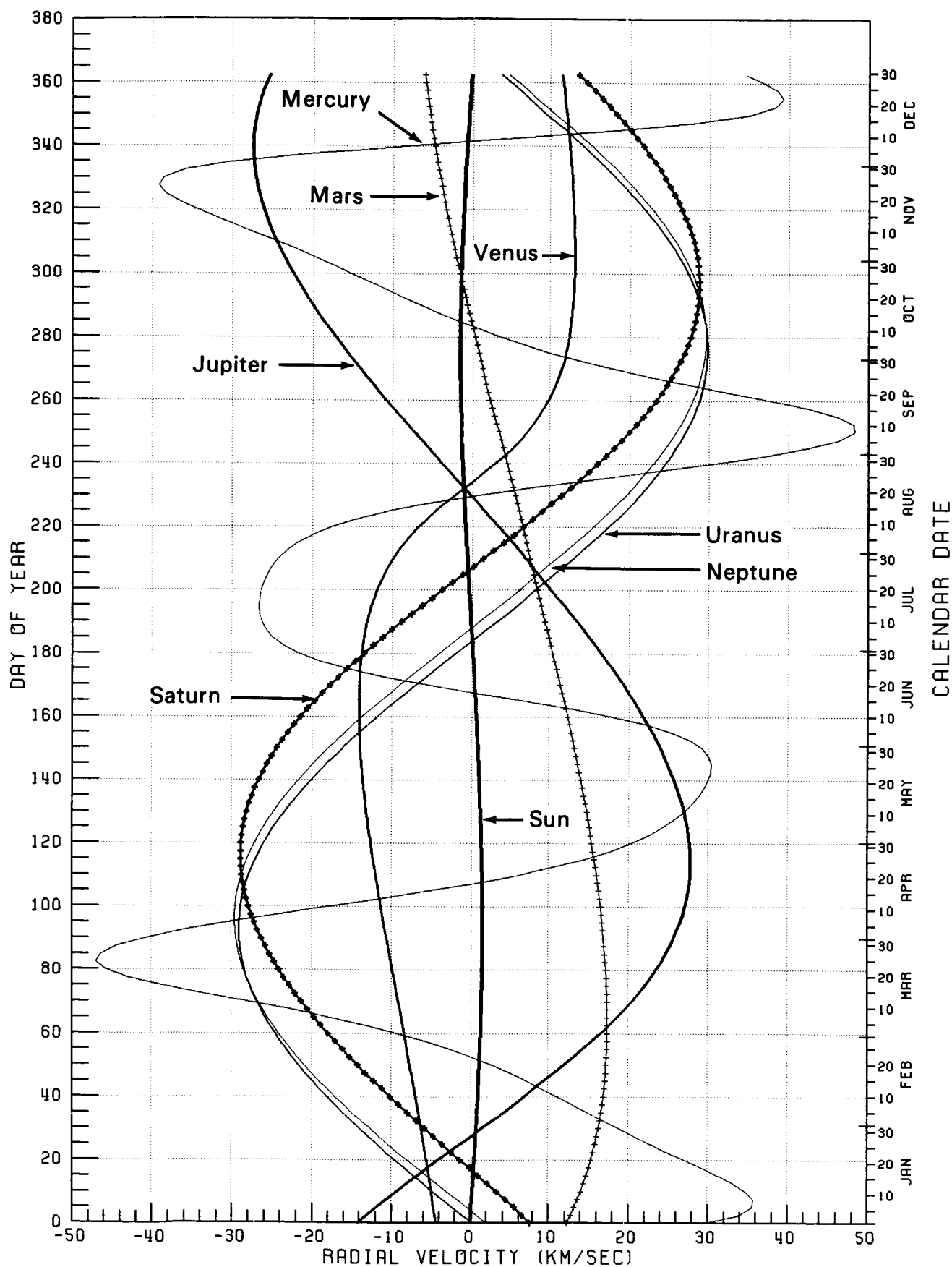
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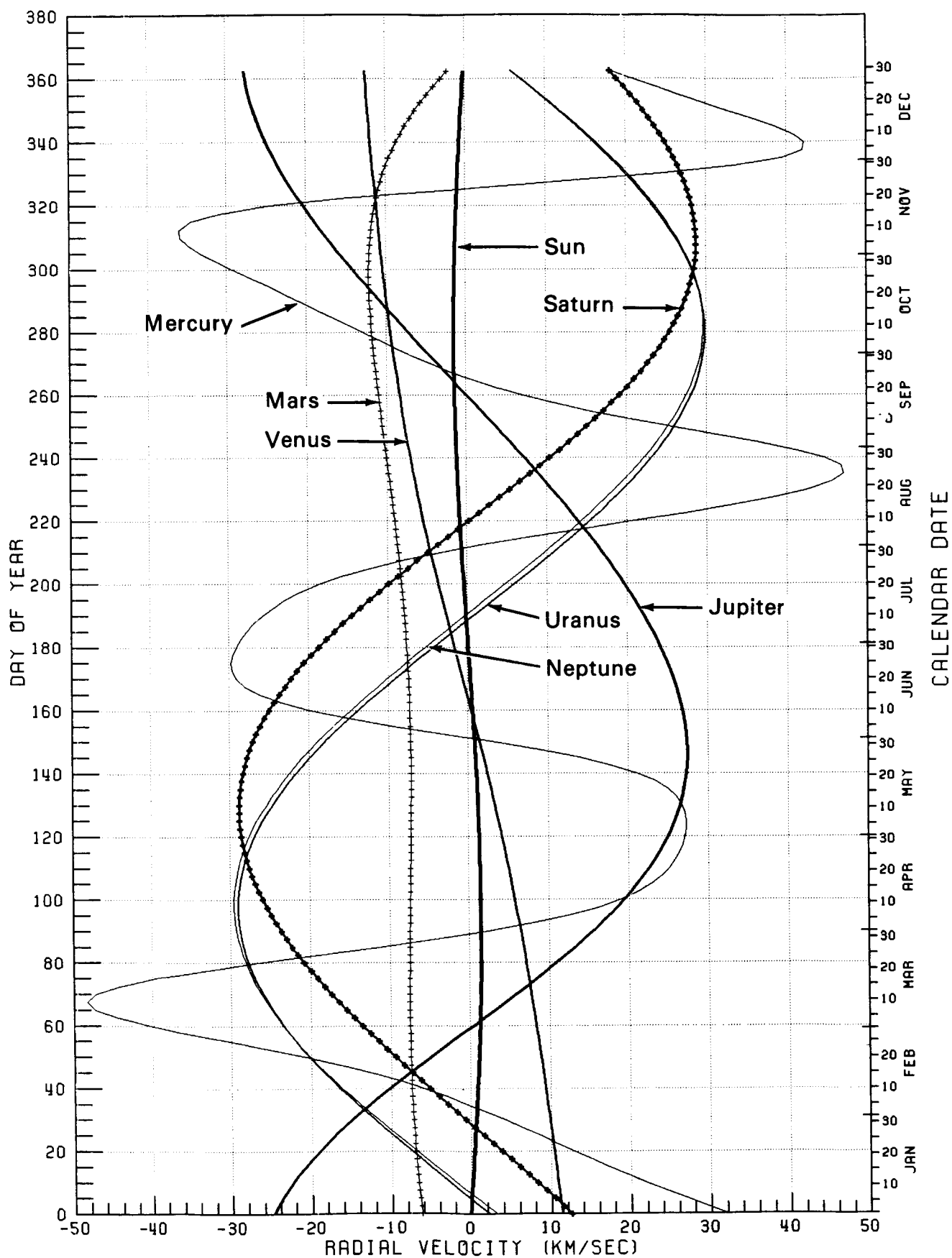
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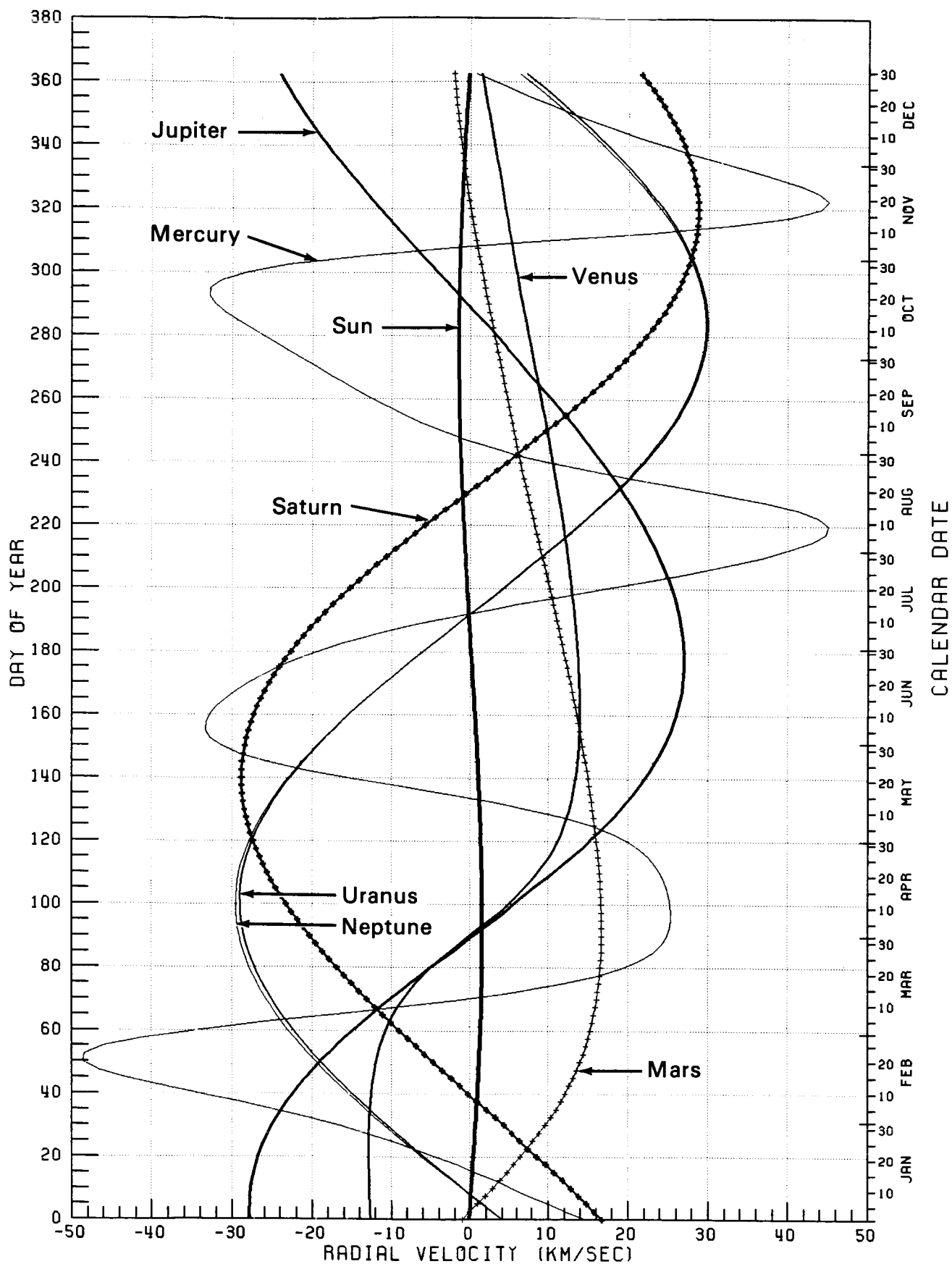
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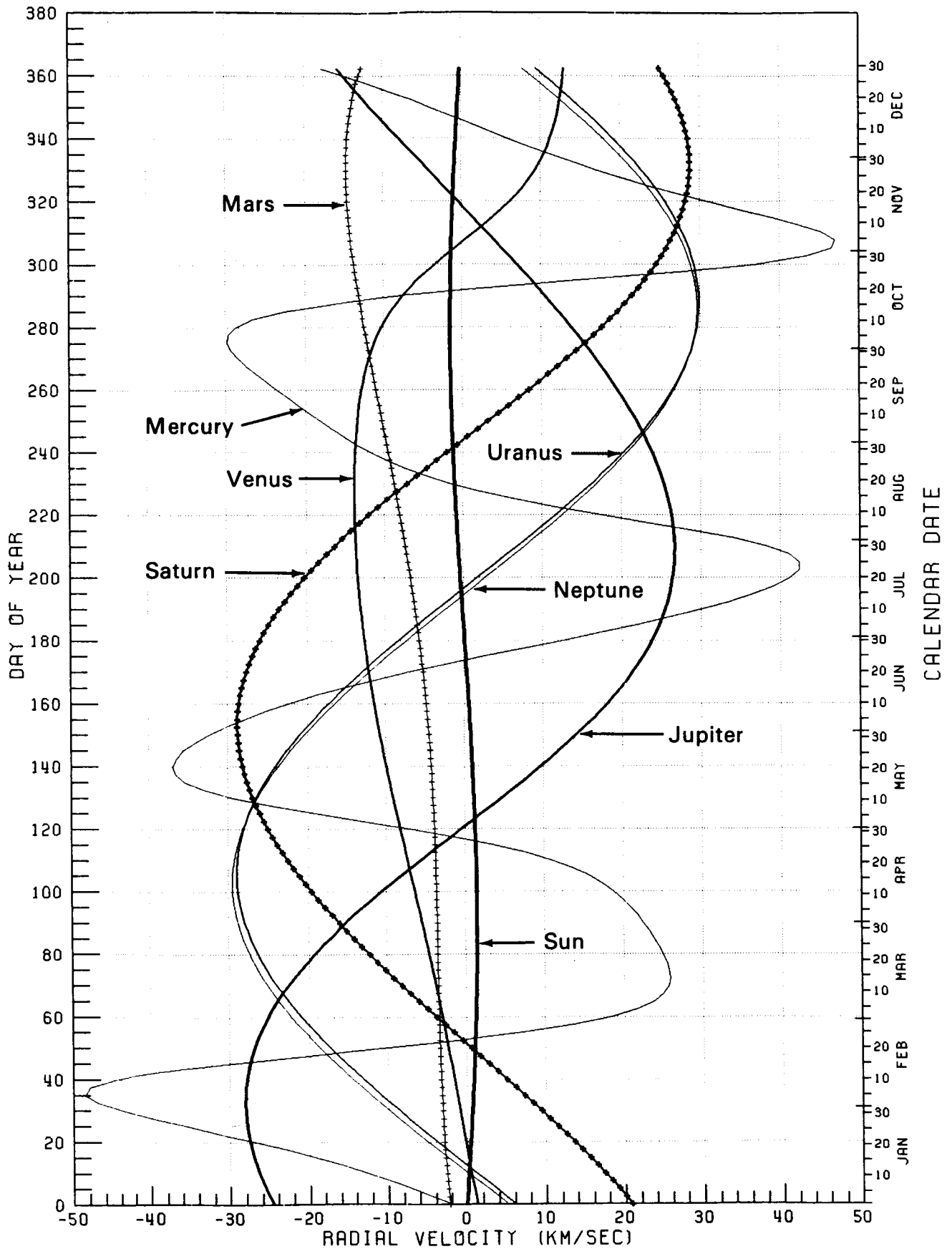


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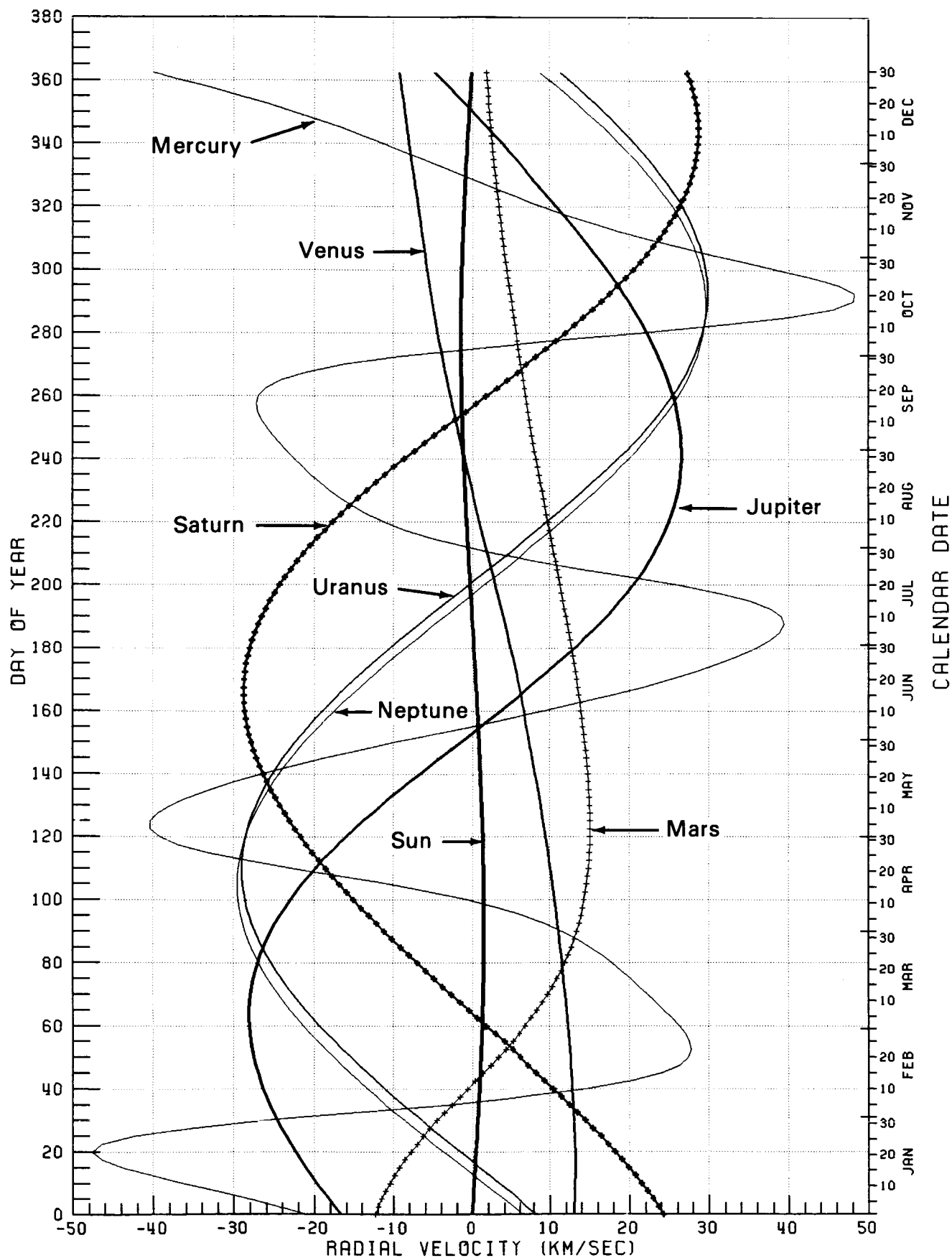


RADIAL VELOCITY OF PLANETS : 1 JAN 1993 - 31 DEC 1993





RADIAL VELOCITY OF PLANETS : 1 JAN 1995 - 31 DEC 1995

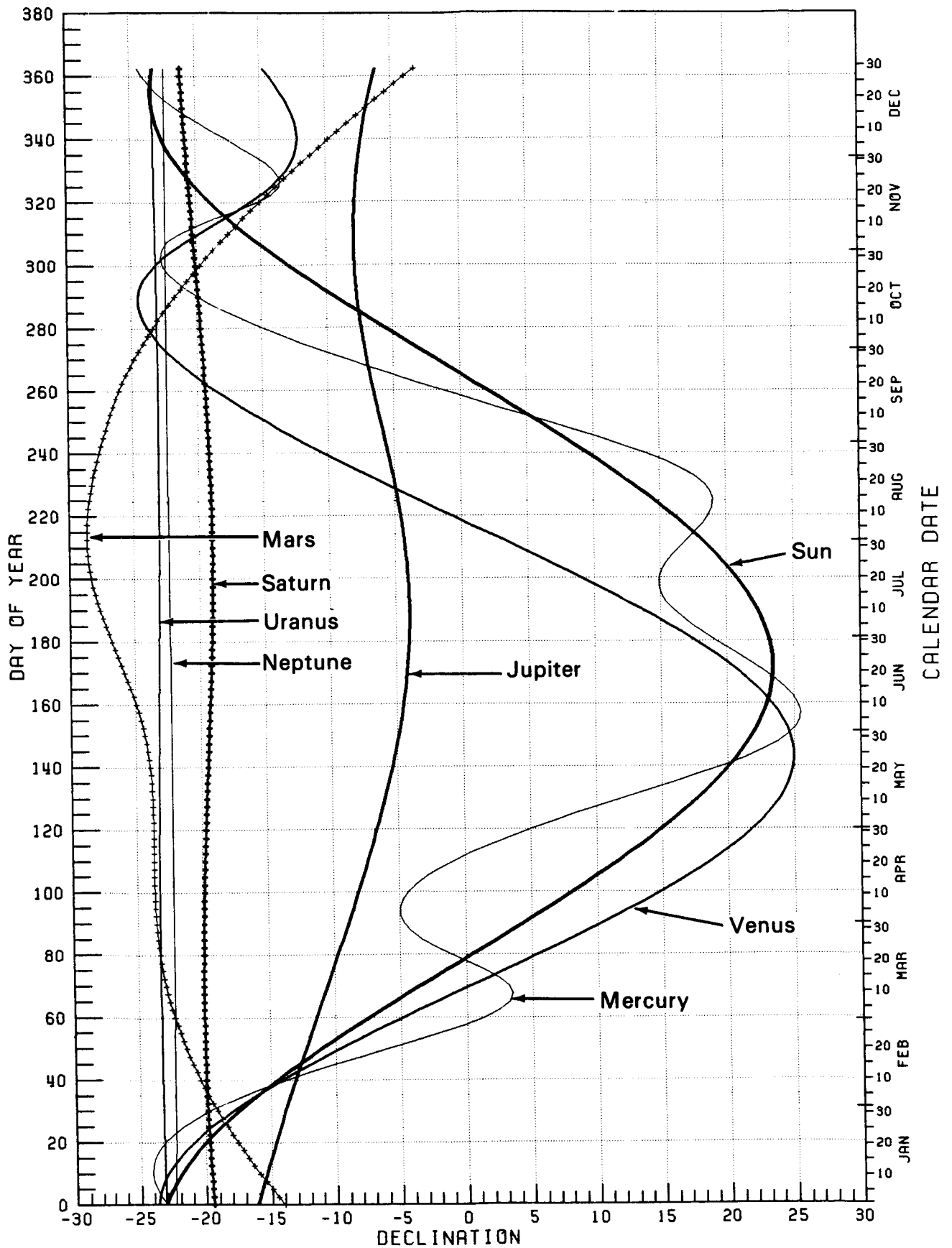


TEN YEAR PLANETARY EPHEMERIS : 1986-1995

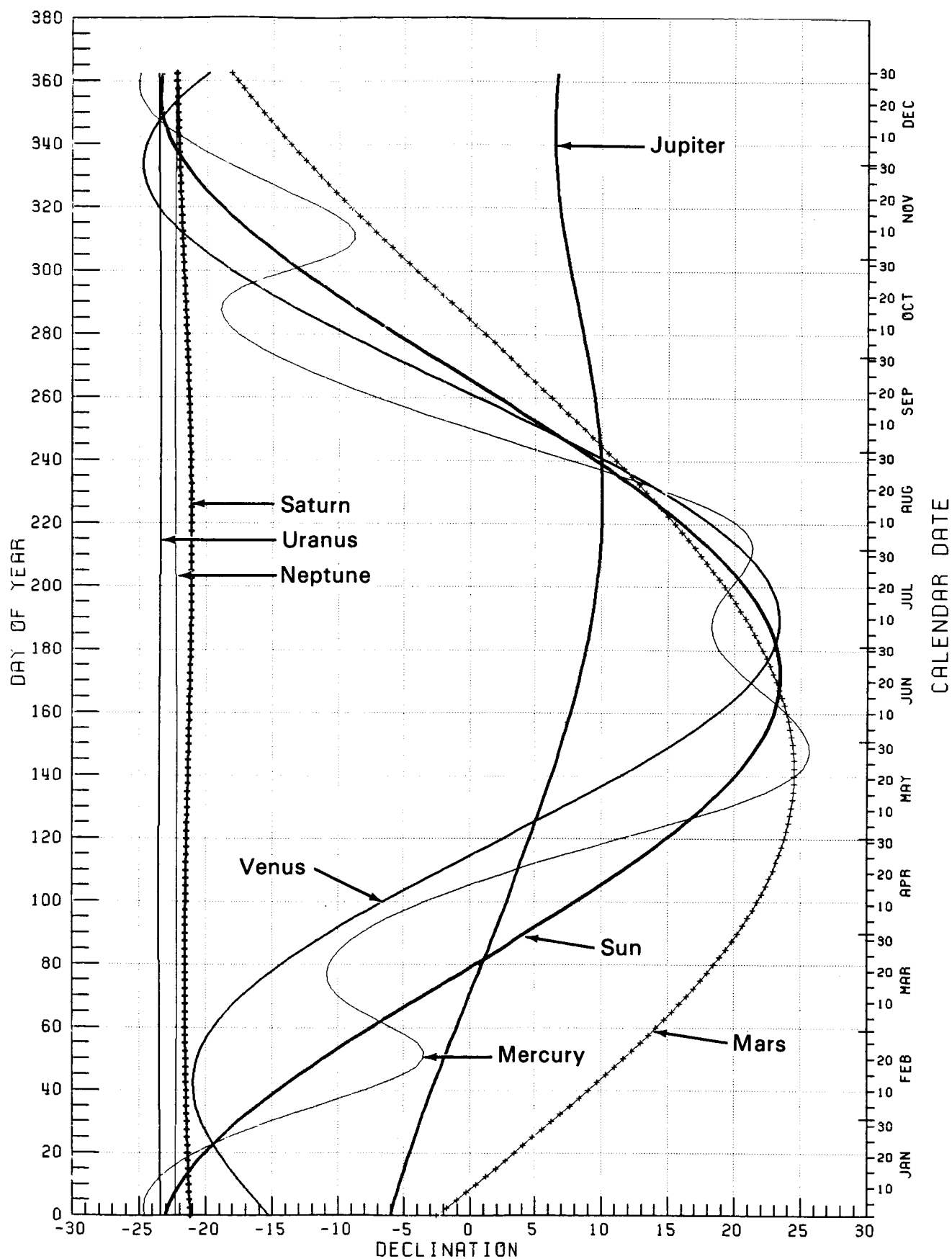
SECTION 6 : Graphic Ephemerides - Declination

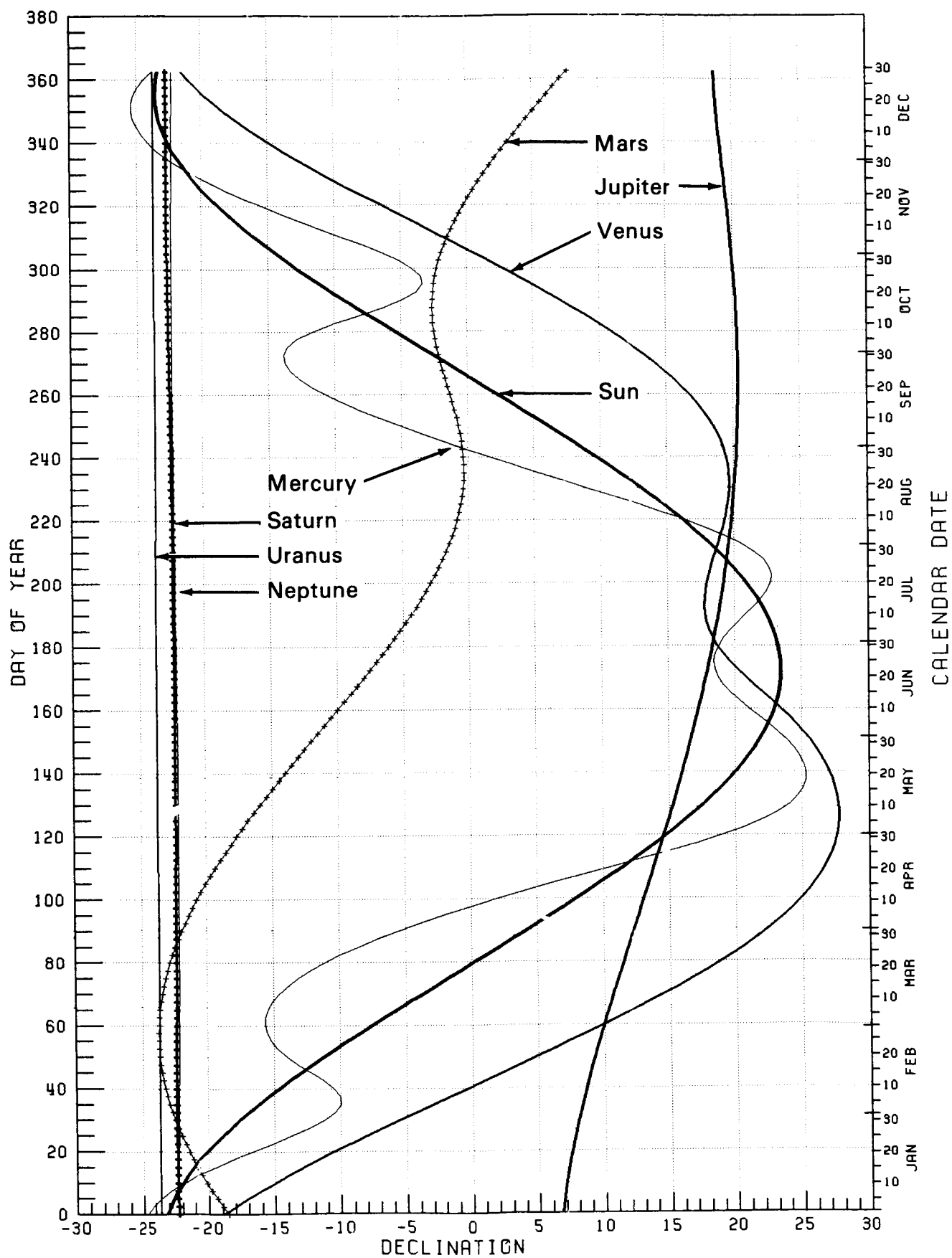
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DECLINATIONS OF PLANETS : 1 JAN 1986 - 31 DEC 1986

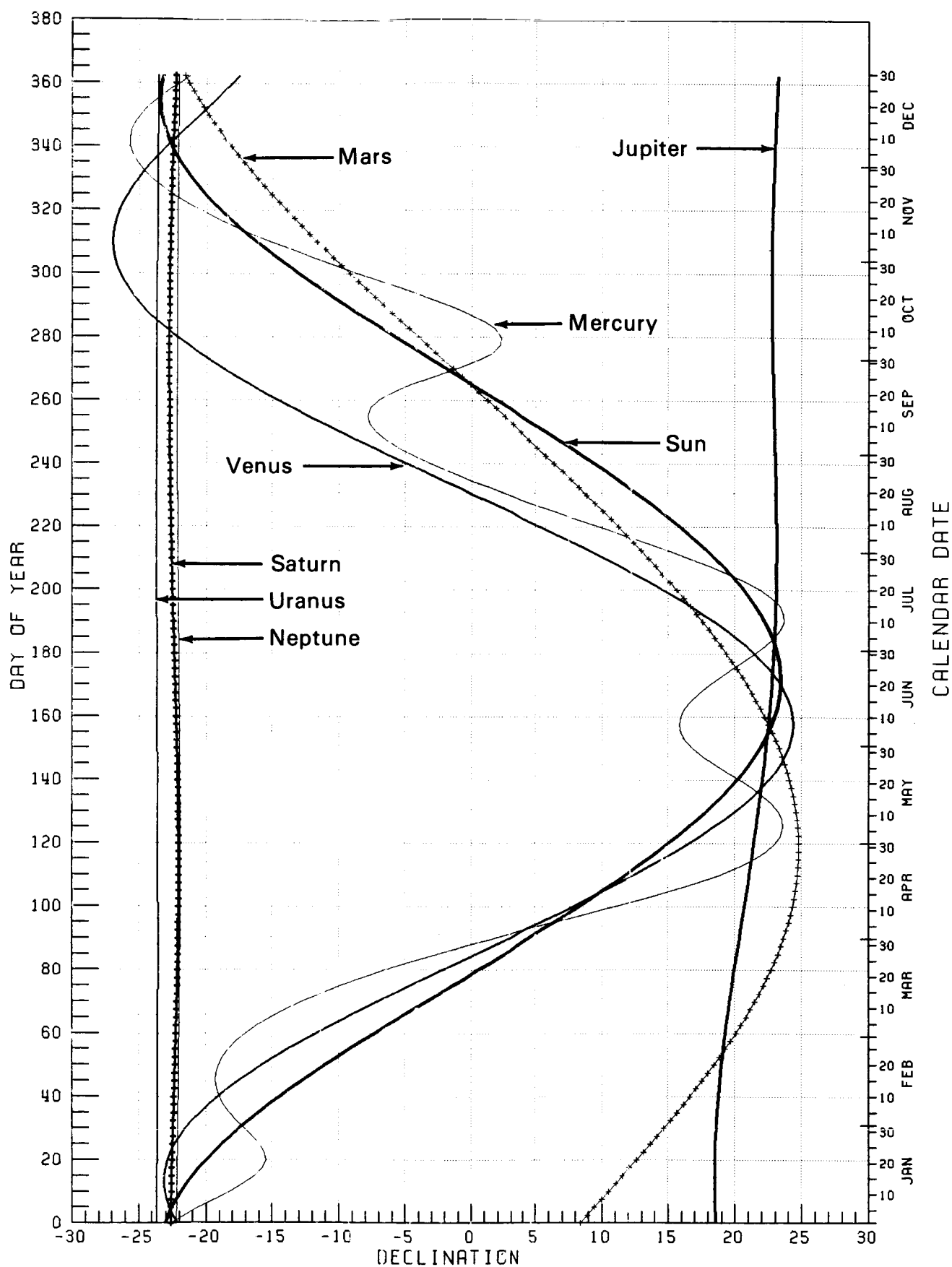


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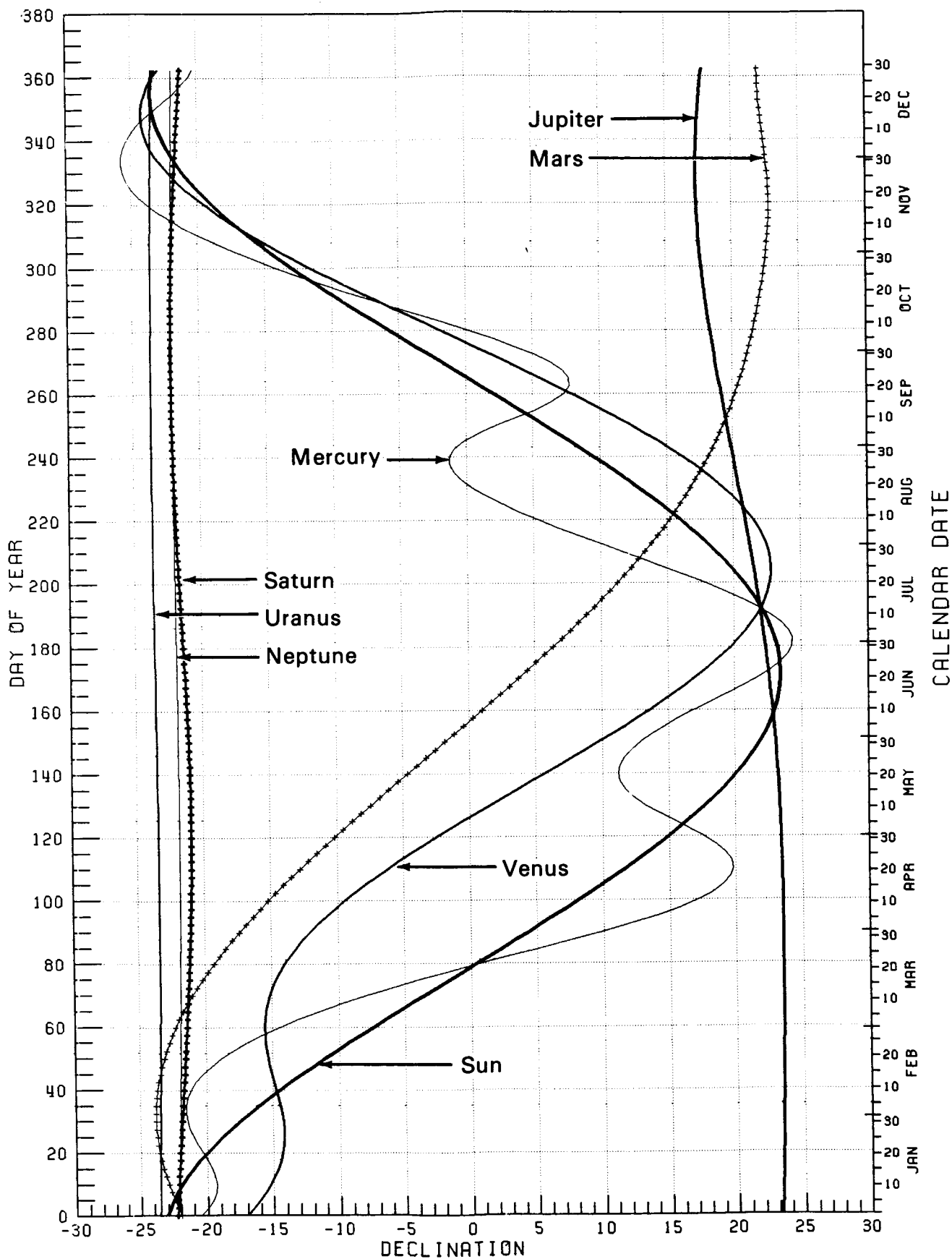




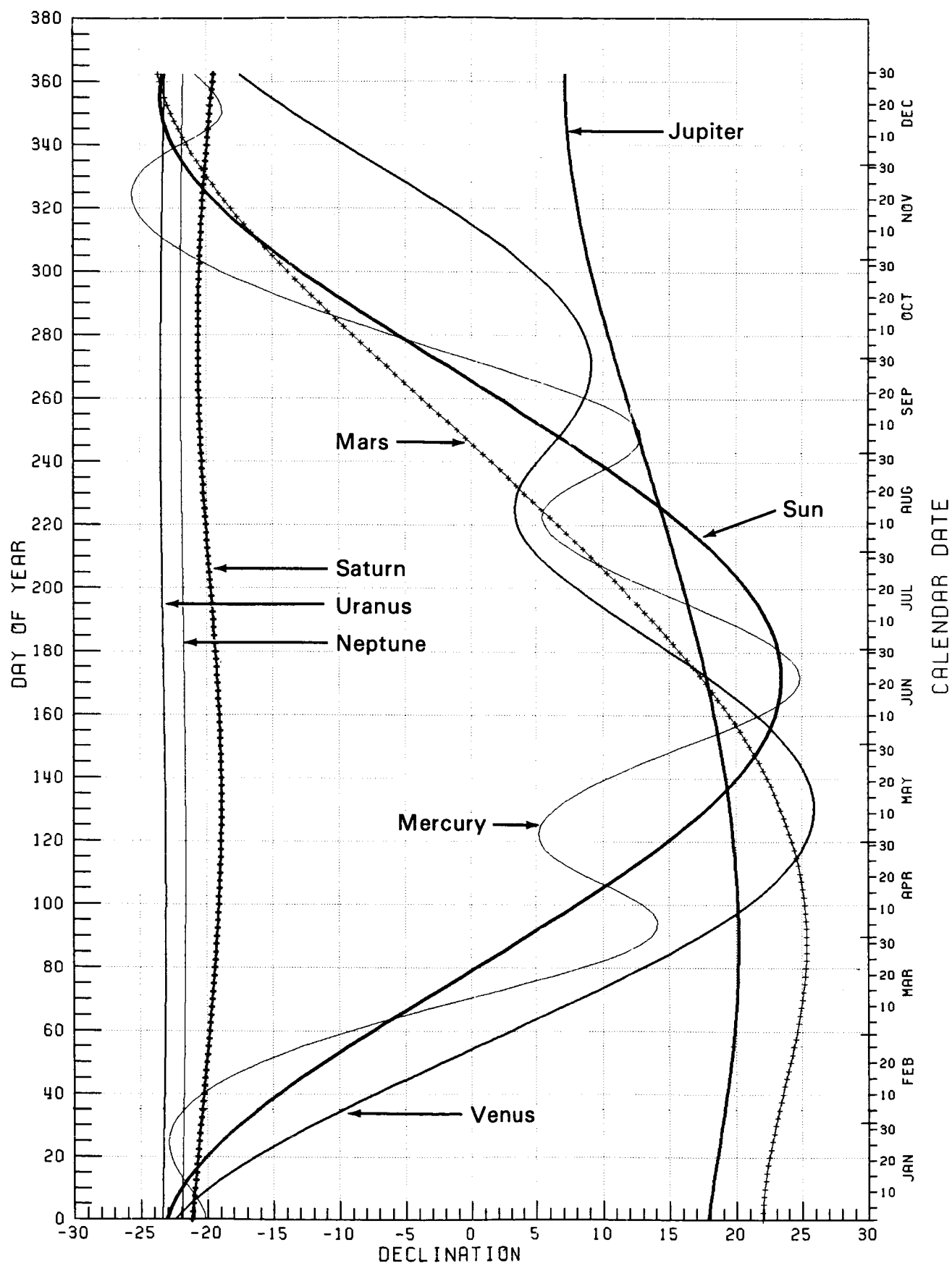
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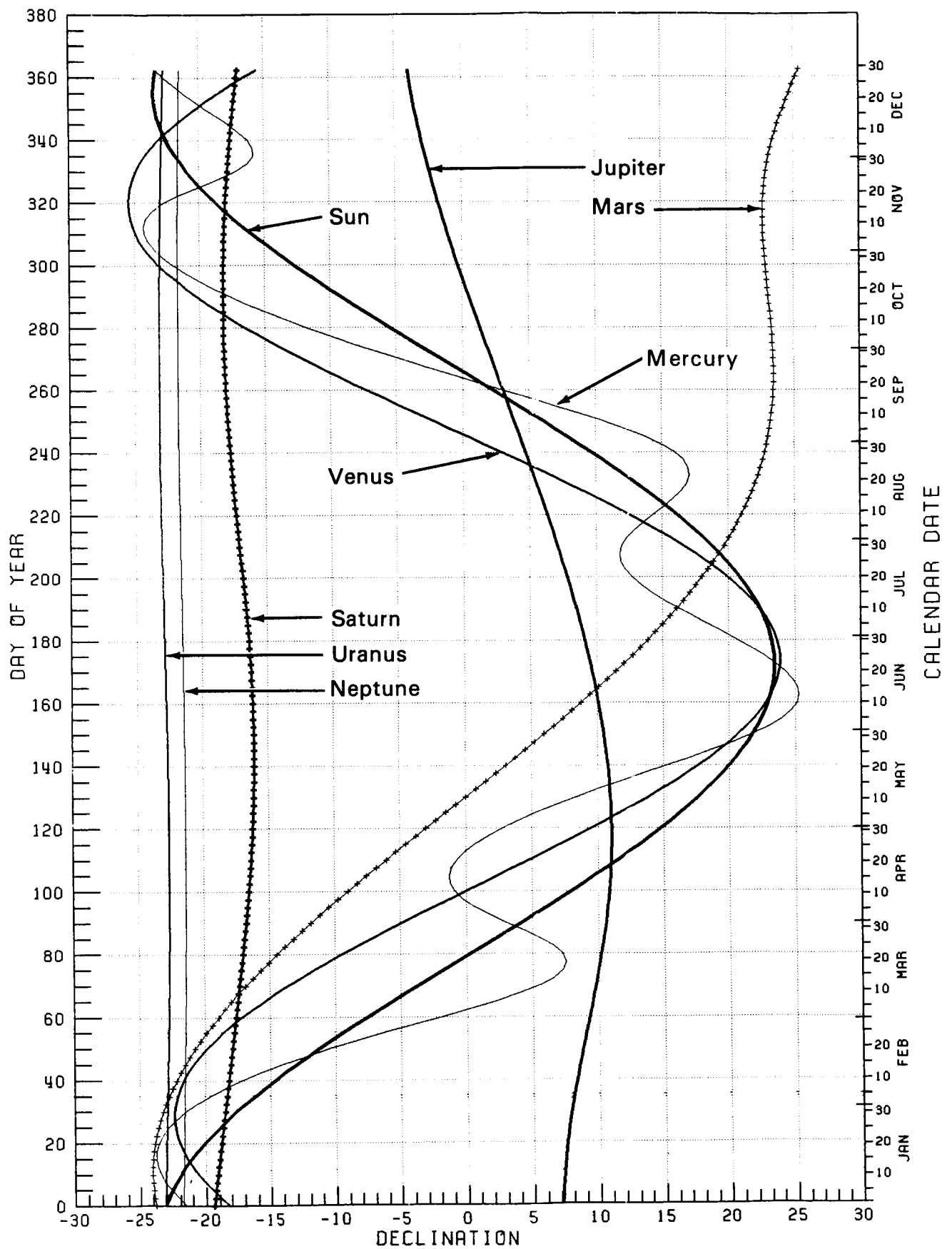
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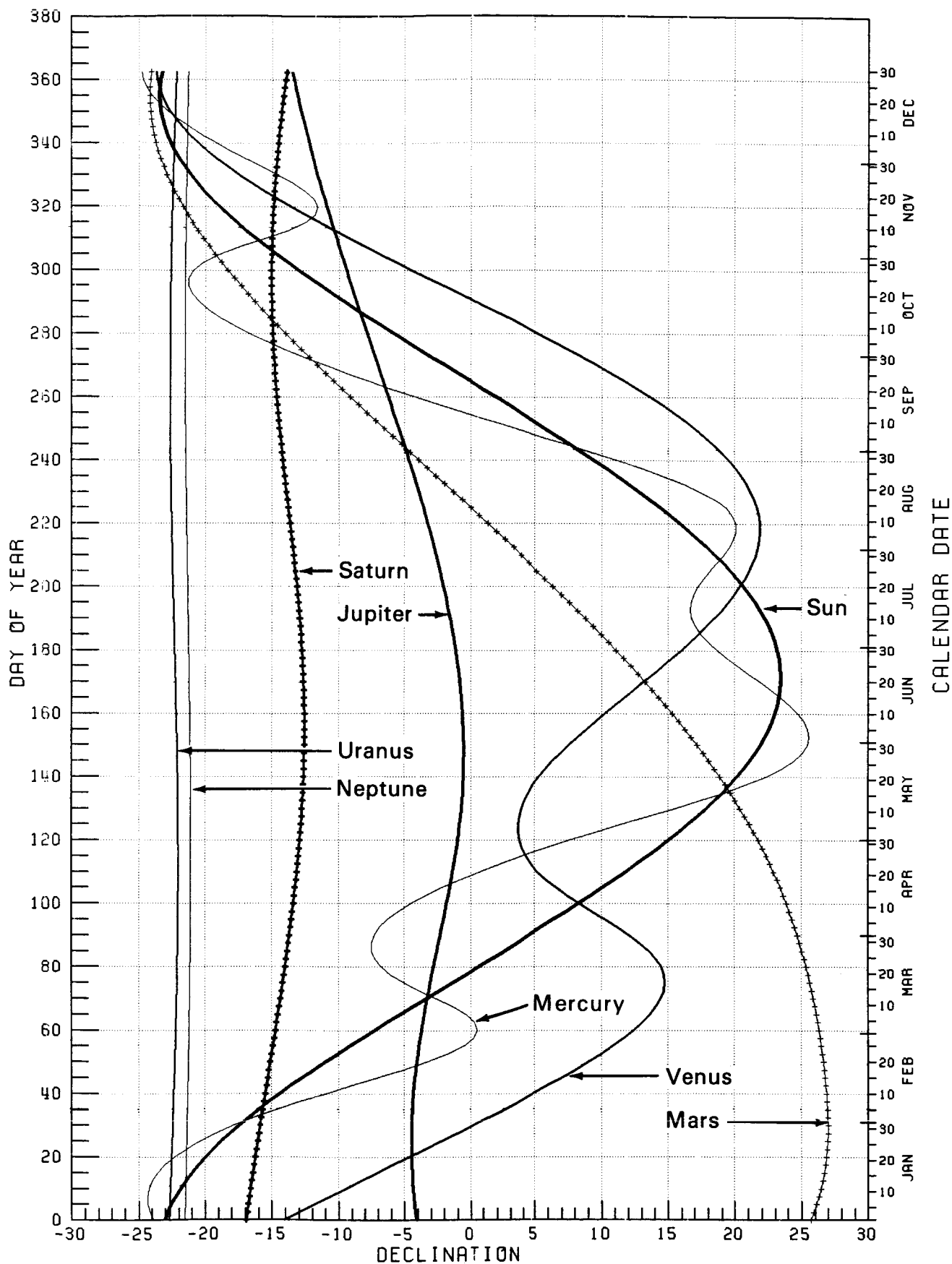
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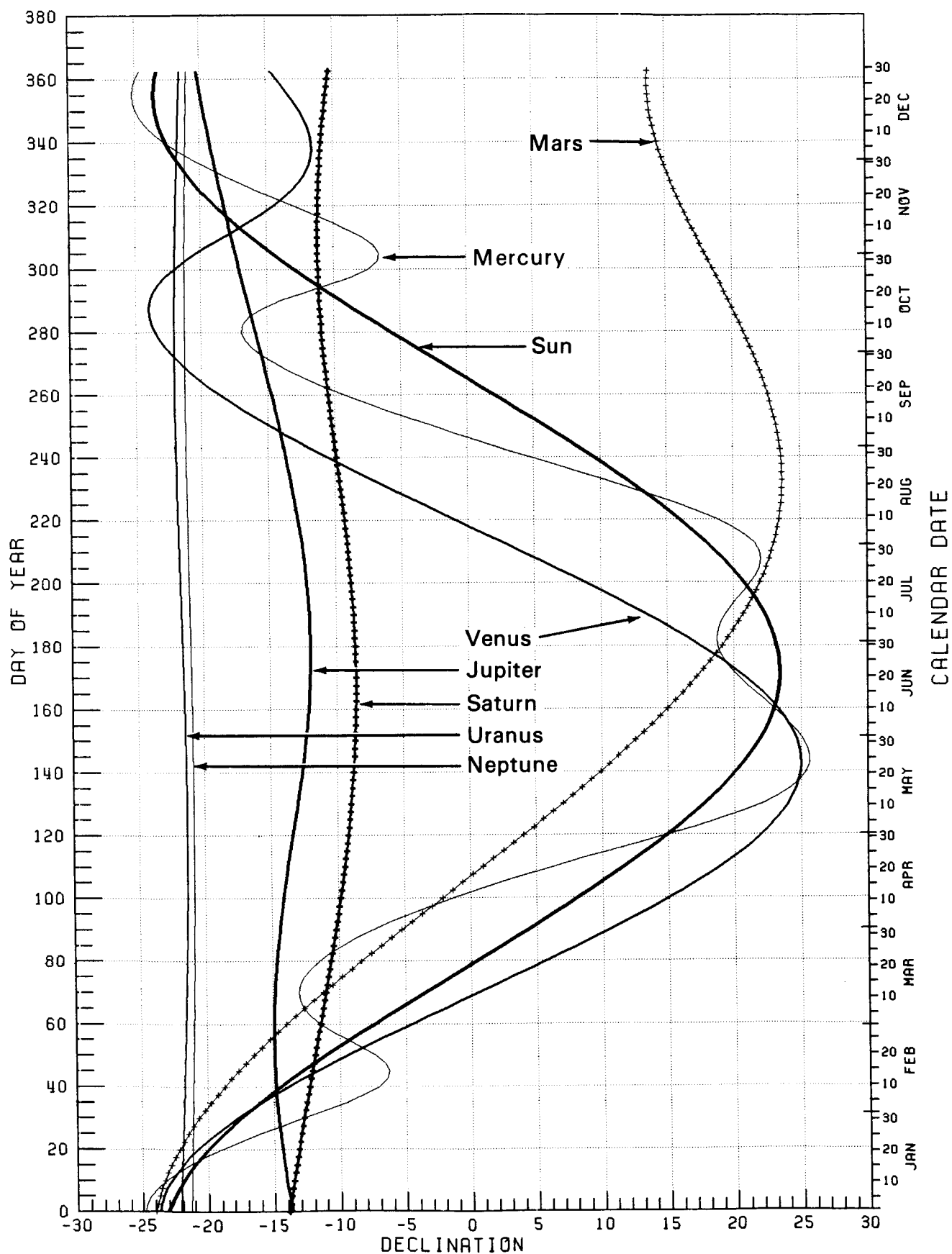
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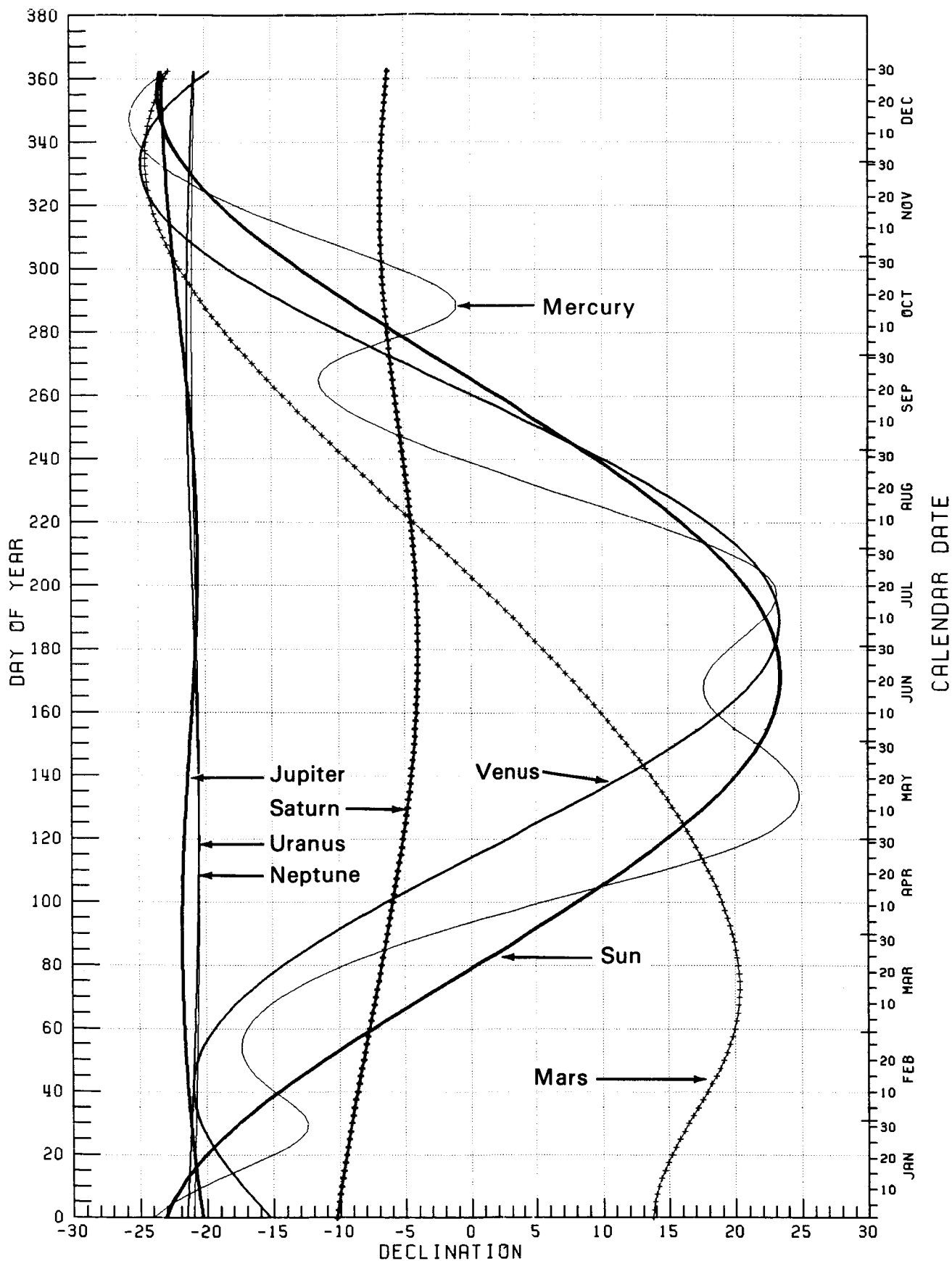
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DECLINATIONS OF PLANETS : 1 JAN 1994 - 31 DEC 1994



DECLINATIONS OF PLANETS : 1 JAN 1995 - 31 DEC 1995

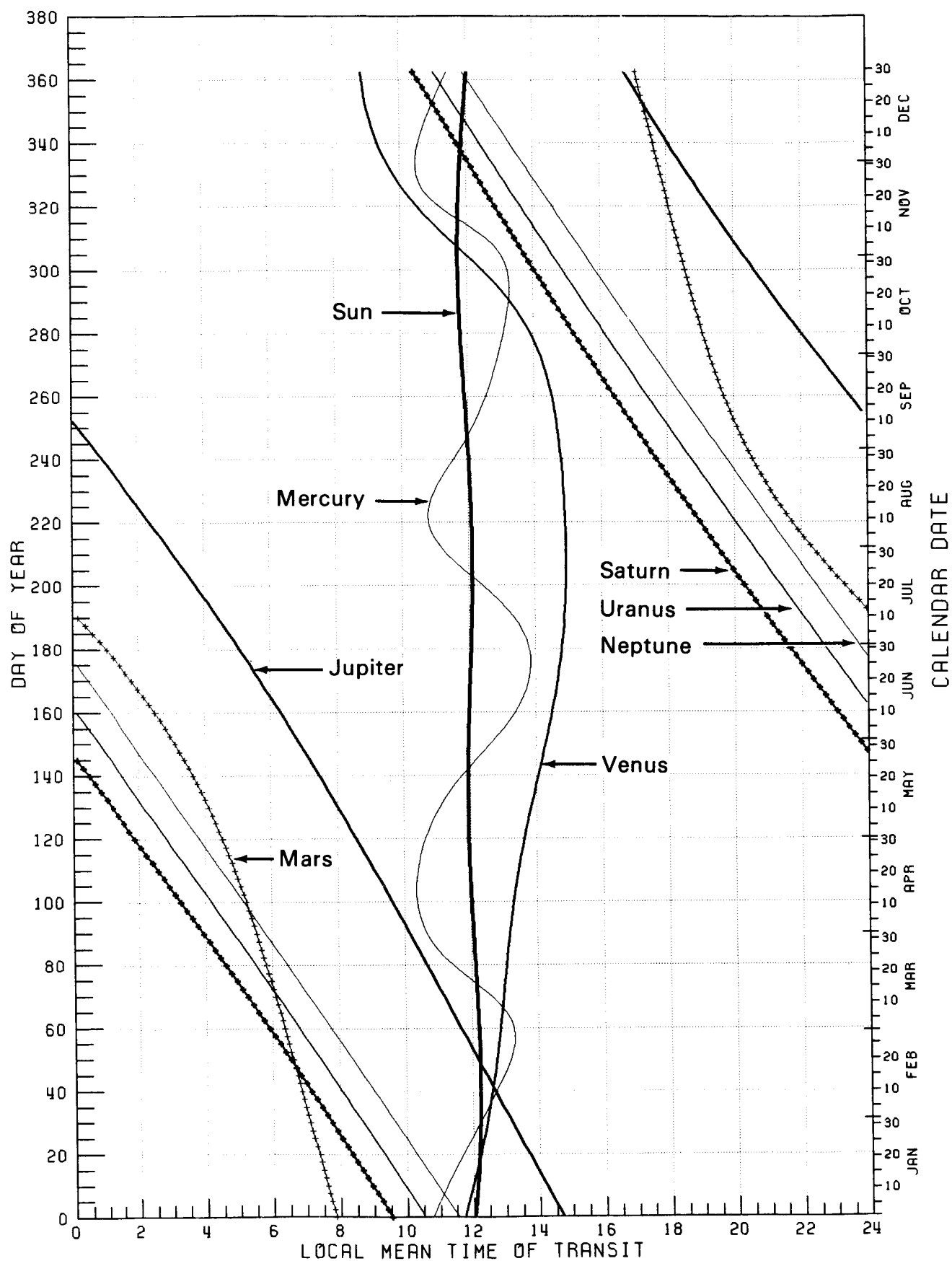


TEN YEAR PLANETARY EPHEMERIS : 1986-1995

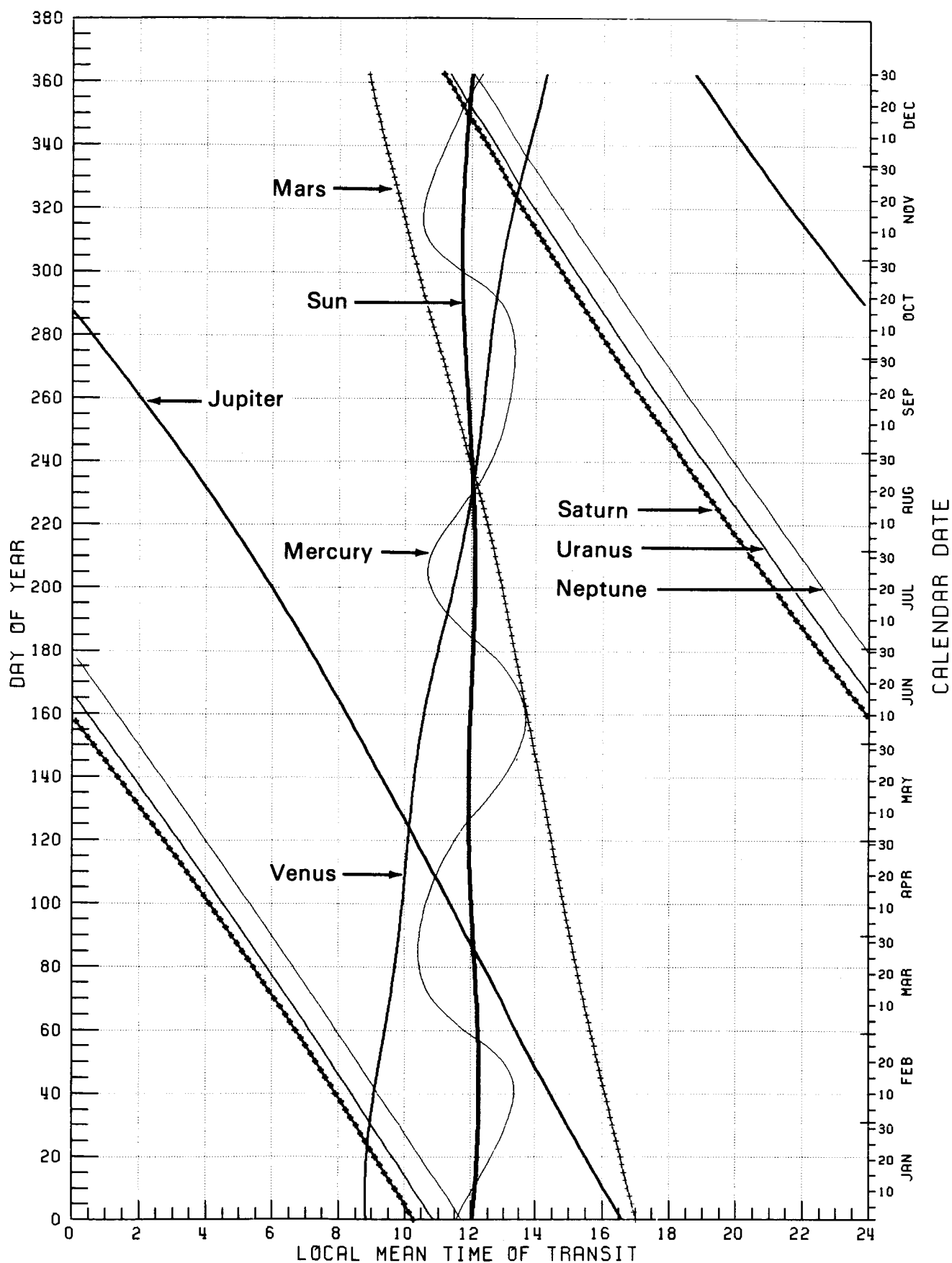
SECTION 7 : Graphic Ephemerides - Mean Time of Meridian Transit

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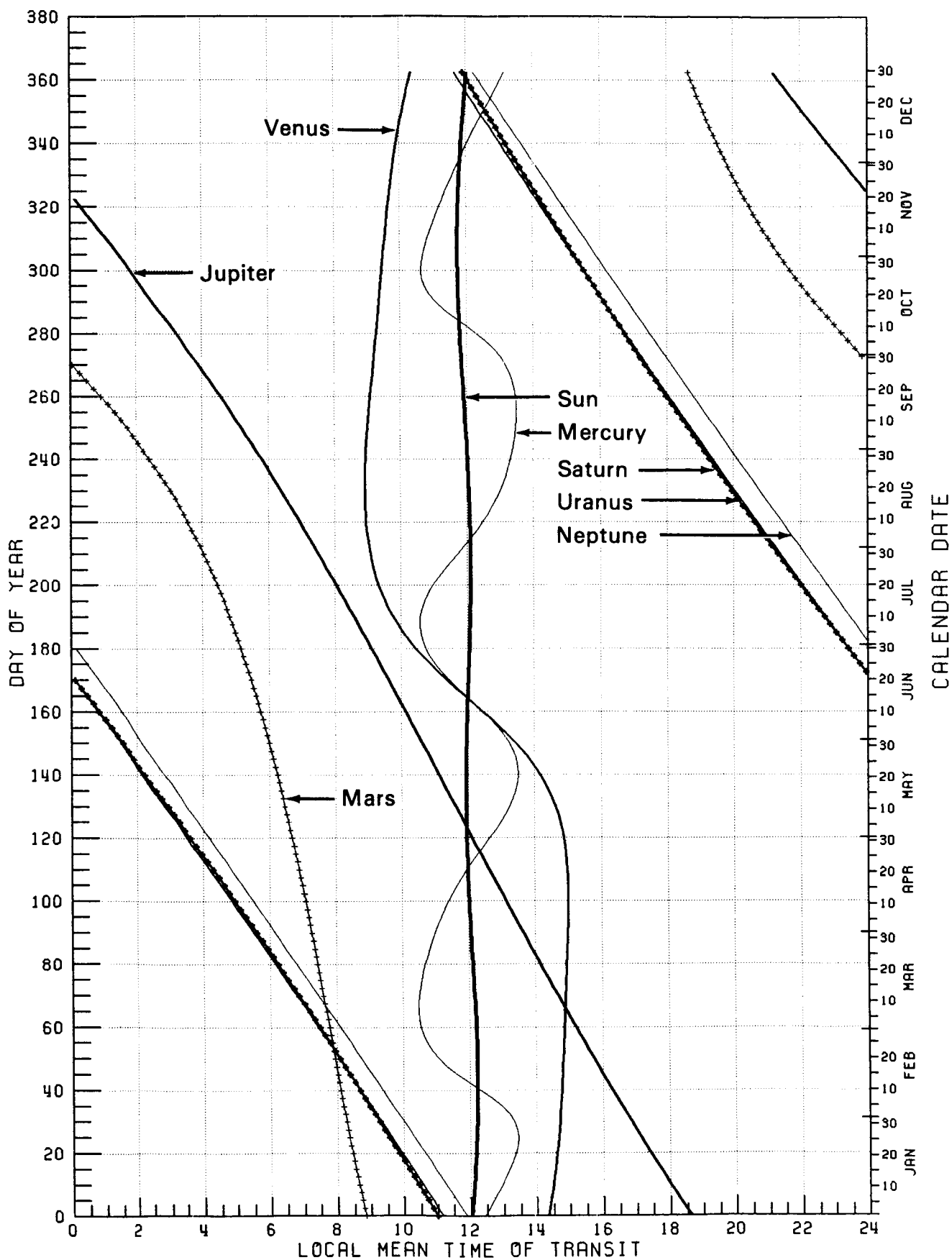
MERIDIAN TRANSIT OF PLANETS : 1 JAN 1986 - 31 DEC 1986



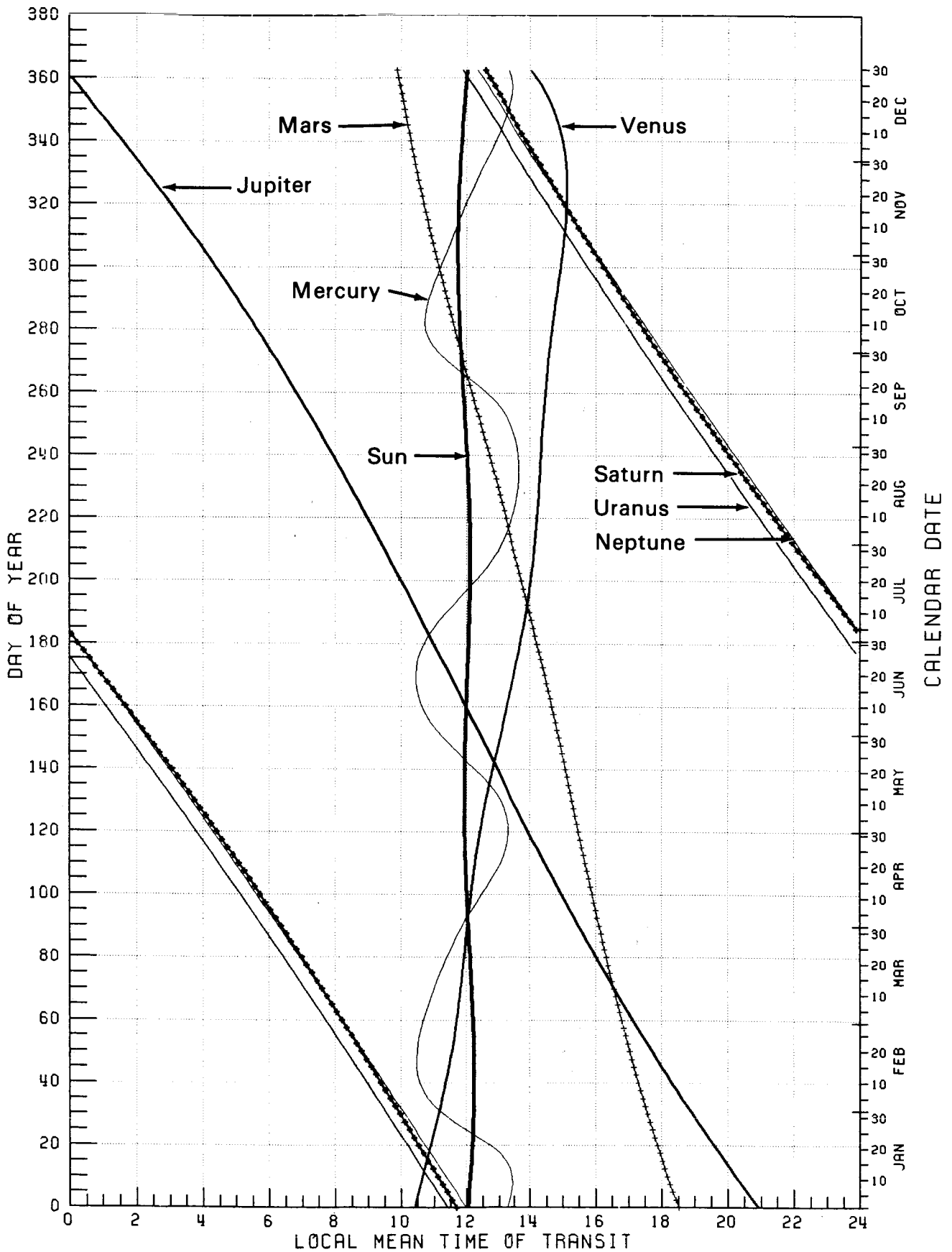
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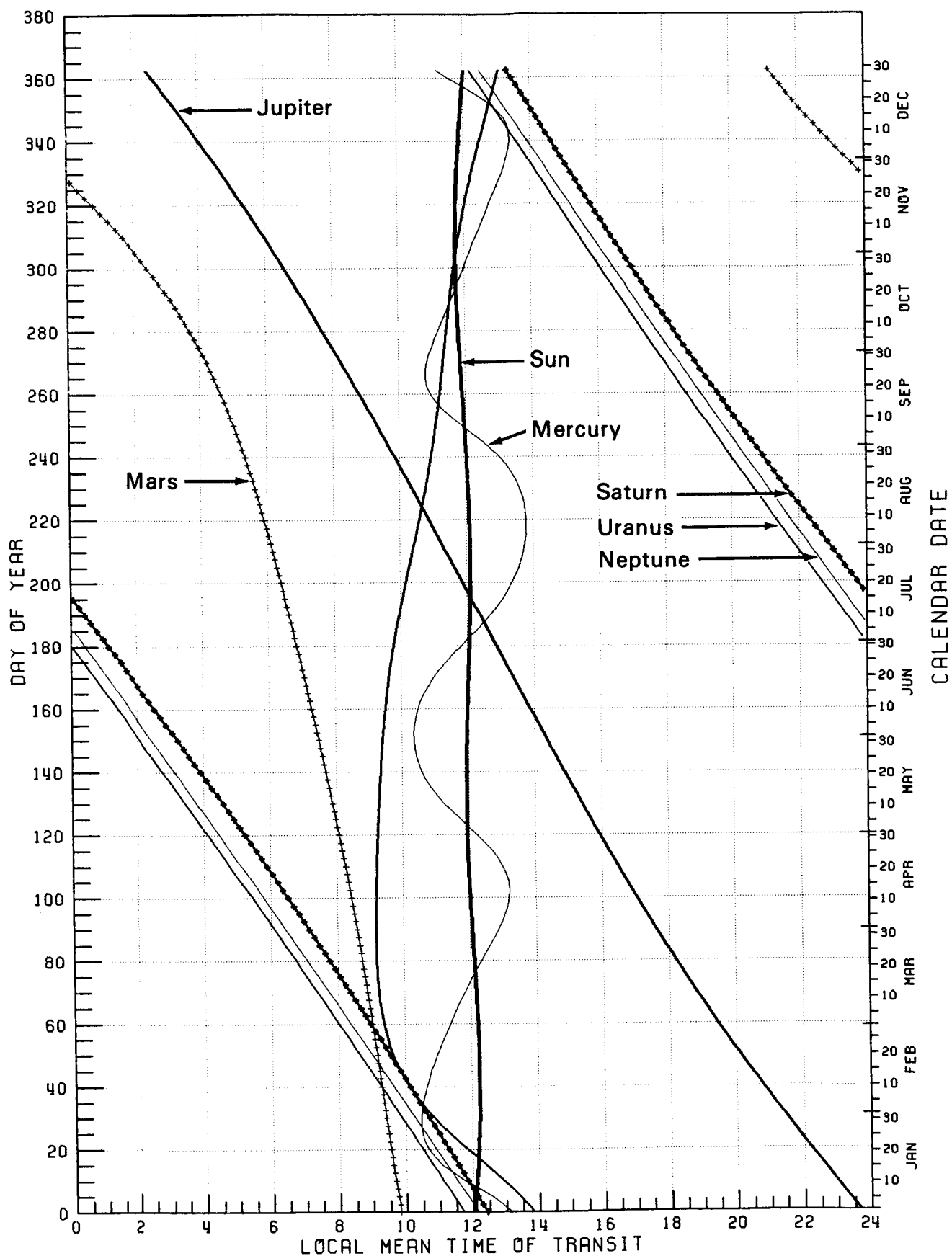
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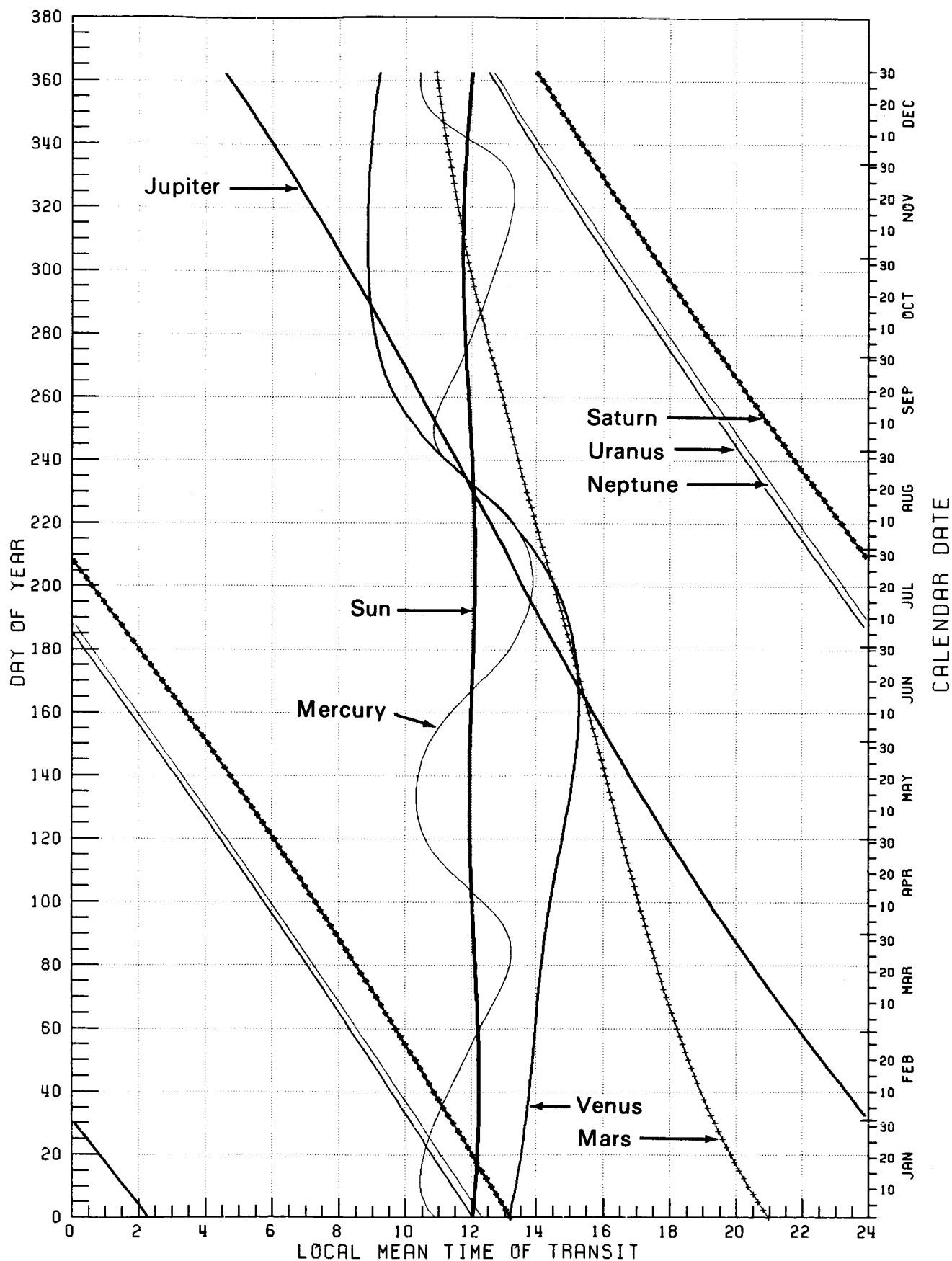
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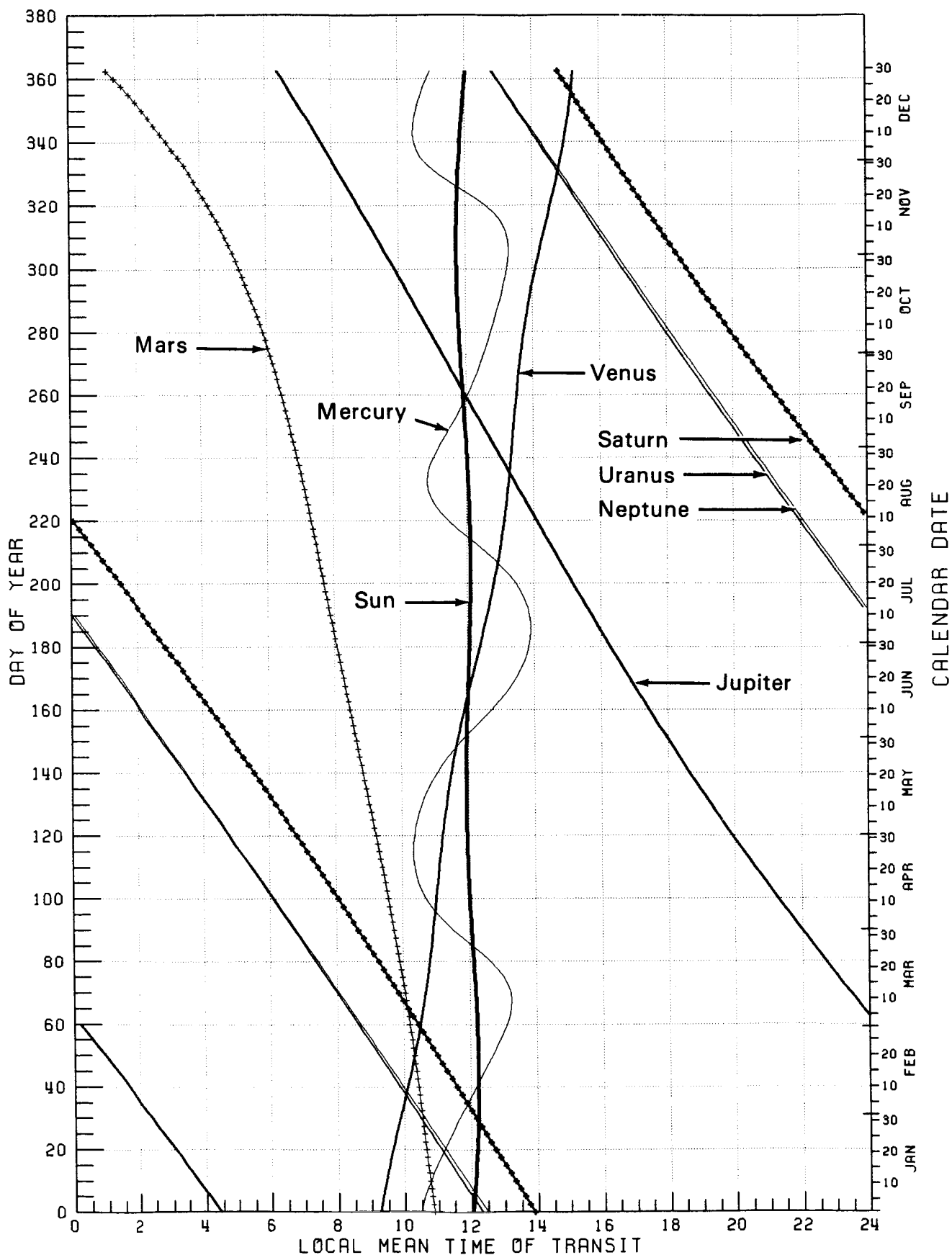
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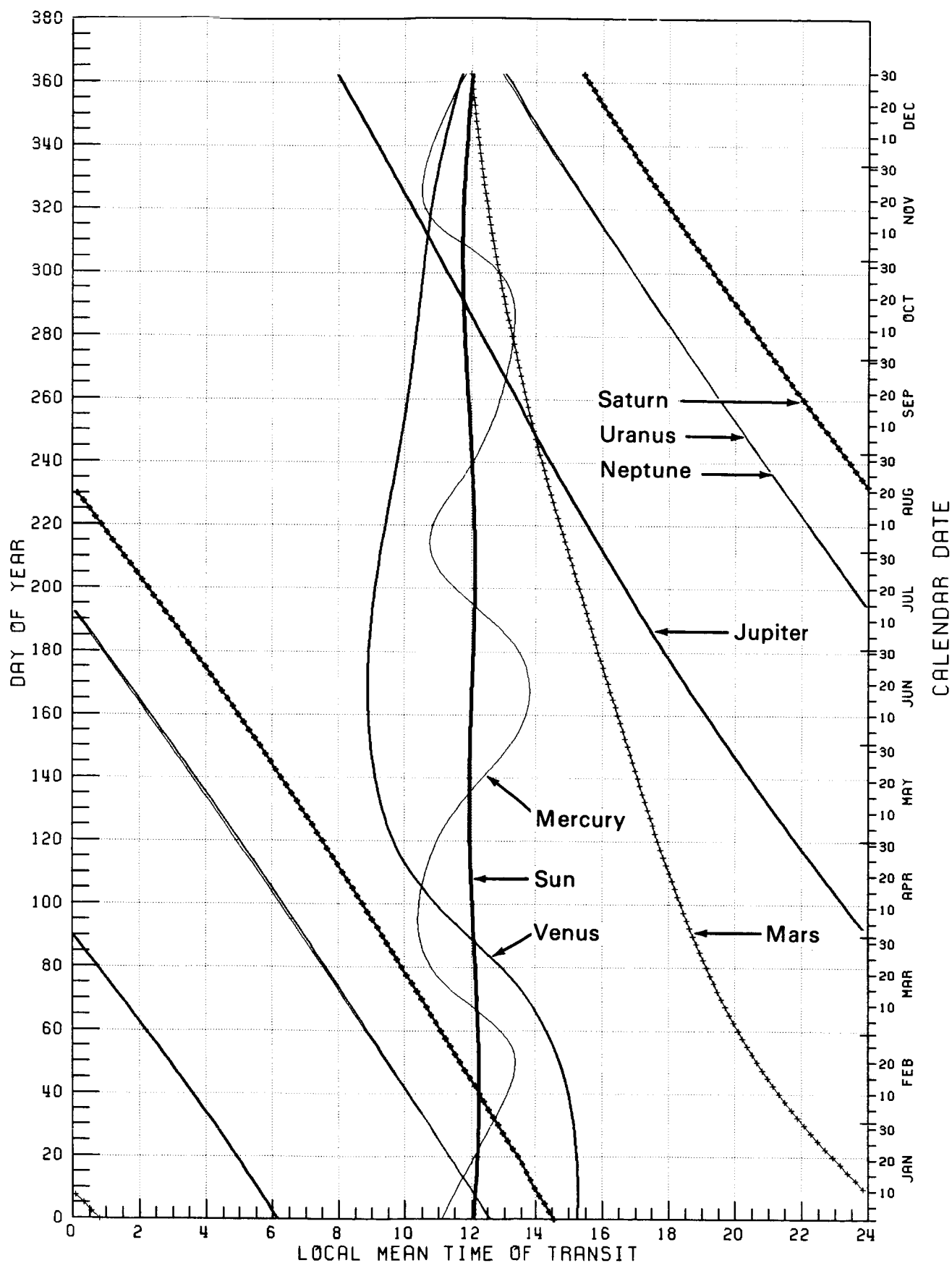
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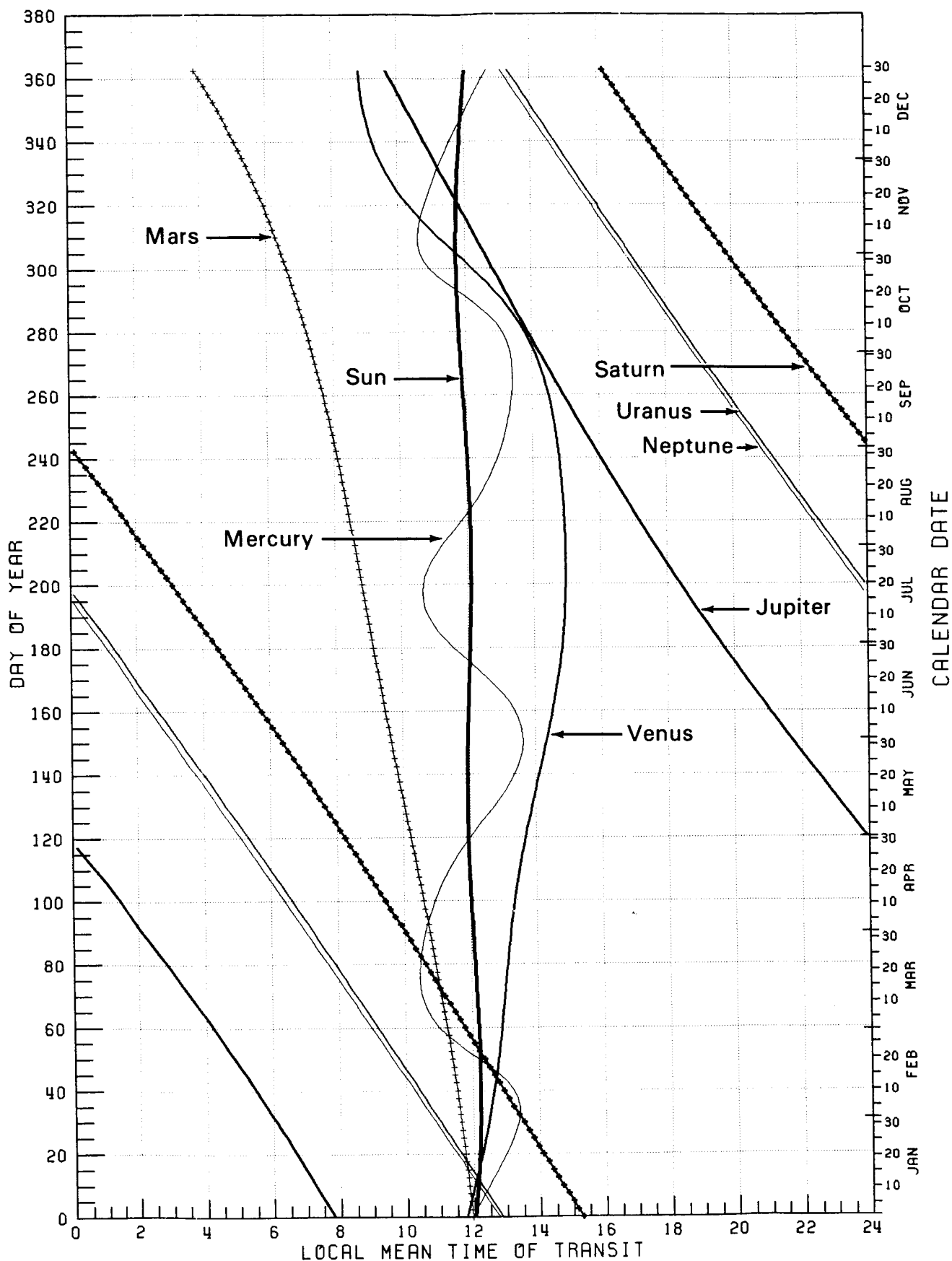
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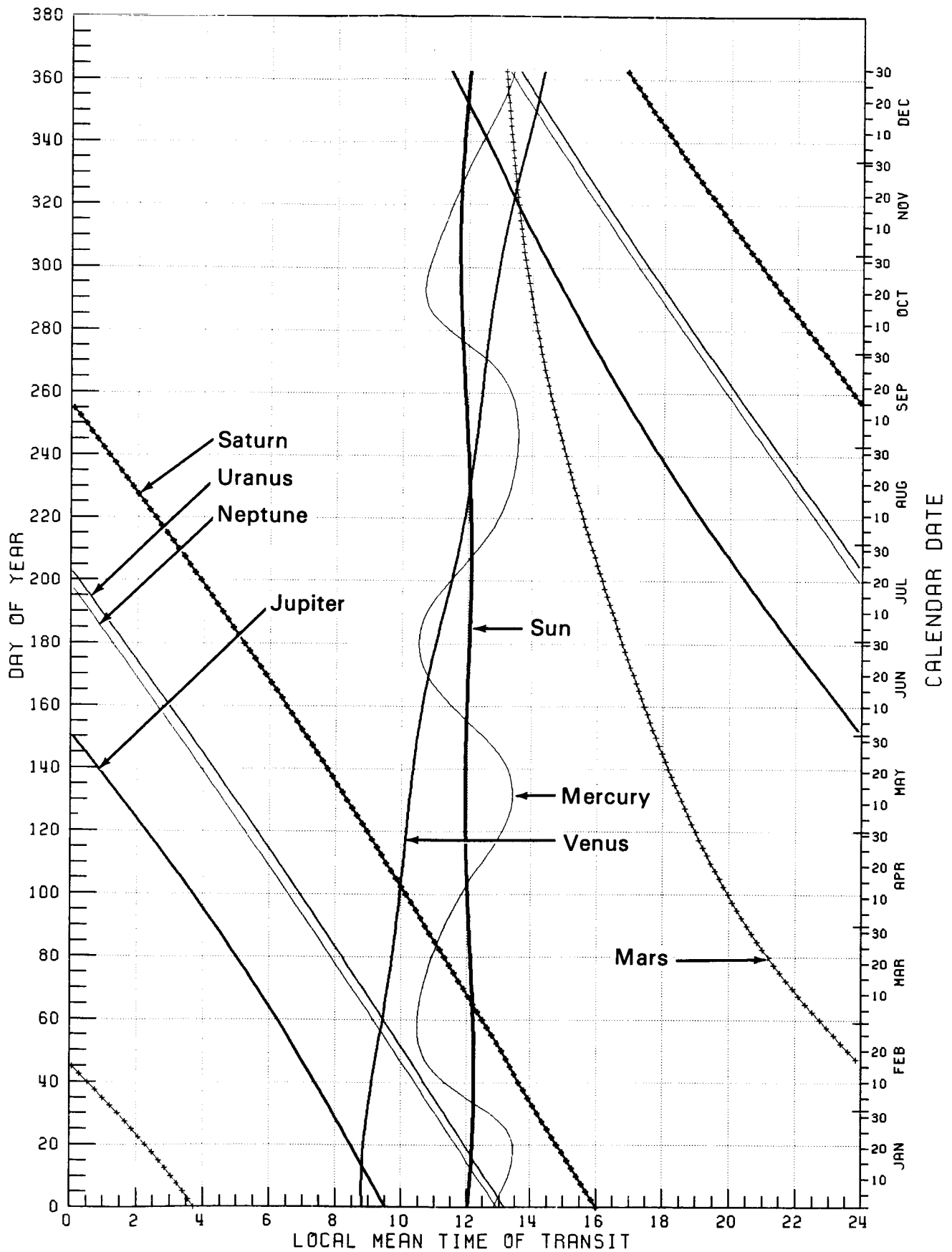
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MERIDIAN TRANSIT OF PLANETS : 1 JAN 1994 - 31 DEC 1994



MERIDIAN TRANSIT OF PLANETS : 1 JAN 1995 - 31 DEC 1995



TEN YEAR PLANETARY EPHEMERIS : 1986-1995

APPENDIX A : A Brief Introduction to Planetary Orbits

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APPENDIX A : A Brief Introduction to Planetary Orbits

Much has been written about planetary theory and the calculation of orbits and ephemerides. Here, we review the basic theory, formulae and algorithms used in the generation of a planetary ephemeris. The discussion will be necessarily brief and does not take into account nutation, the aberration of starlight or the effects of light-time travel. The interested reader is encouraged to check the references for further information and details.

Before a geocentric ephemeris at time 't' can be calculated for any given planet, it's necessary to know the Earth's position with respect to the Sun at that instant. We begin by calculating 'T', the number of Julian centuries of 36525 ephemeris days which have elapsed since 0.5 January 1900. If time 't' is expressed as the Julian Date (i.e. - the number of days elapsed since Greenwich Mean Noon on 0 January 4713 BC), then time 'T' is just :

$$T = (t - 2415020.0) / 36525 \quad [1-1]$$

The geometric mean longitude of the Sun 'Ls', referred to the mean equinox of the date is :

$$Ls = 279.69668 + 36000.76892 T + 0.0003025 T^{**2} \quad [1-2]$$

The mean anomaly of the Sun 'M' is :

$$M = 358.47583 + 35999.04975 T - 0.000150 T^{**2} - 0.0000033 T^{**3} \quad [1-3]$$

The eccentricity of the Earth's orbit 'e' and the obliquity of the Earth's axis 'o' are given by :

$$e = 0.01675104 - 0.0000418 T - 0.000000126 T^{**2} \quad [1-4]$$

$$o = 23.452294 - 0.0130125 T - 0.00000164 T^{**2} + 0.000000503 T^{**3} \quad [1-5]$$

Kepler's equation solves for a quantity called the eccentric anomaly 'E' as follows :

$$E = M + e \sin E \quad [1-6]$$

where 'E' and 'M' are expressed in radians.

Examining Kepler's equation, we find that it's a transcendental equation in 'E' and cannot be solved directly. However, the solution can be obtained to sufficient accuracy through an iterative process. In the first iteration, 'E' is set equal to the mean anomaly 'M' in the right hand side of equation [1-6]. In

successive iterations, the eccentric anomaly is solved for by substituting the previous solution to 'E' into the right hand side of the equation. Normally, only half a dozen iterations are needed for the solution to 'E' to converge.

With an adequate value for the eccentric anomaly 'E', the true anomaly 'v' is solved as :

$$v = 2 \text{ ArcTan } [e0 \text{ Tan}(E/2)] \quad [1-7]$$

$$\text{where : } e0 = \text{Sqrt}((1+e)/(1-e)) \quad [1-7a]$$

The sun's true geometric longitude 'ls' is then :

$$ls = Ls + v - M \quad [1-8]$$

Distances in the solar system are usually expressed in Astronomical Units or AU's. The AU is approximately equal to the Earth's mean distance from the Sun and is defined as 1.496E+08 kilometers. The Sun's radius vector 'R' (Earth's distance from the Sun in AU's) is given by :

$$R = a (1 - e \text{ Cos } E) \quad [1-9]$$

where 'a' is the semi-major axis of the Earth's orbit (a=1.0000002).

Finally, the Sun's right ascension 'As' and declination 'Ds' are calculated from :

$$As = \text{ArcTan}[(\text{Cos } o \text{ Sin } ls) / \text{Cos } ls] \quad [1-10]$$

$$Ds = \text{ArcSin } [\text{Sin } o \text{ Sin } ls] \quad [1-11]$$

With the Sun's position with respect to the Earth determined, we can now proceed with the calculation of a planetary ephemeris. The unperturbed orbit of any planet about the Sun can be described by seven elements, referred to an initial time 't0'. They are defined as follows :

- a - semimajor axis of the orbit.
- e - eccentricity of the orbit.
- i - inclination of the orbit to the ecliptic.
- F - longitude of the ascending node of the orbit on the ecliptic, measured from the equinox.
- w - argument of perihelion.
(longitude of perihelion, measured from the ascending node of the orbit).
- L - mean longitude of the planet along its orbit

at time equals 't₀'.

P - sidereal period of the planet around the Sun.

A number of other useful quantities can be derived from relationships between the orbital elements.

The longitude of perihelion 'W' is defined as :

$$W = F + w \quad [1-12]$$

The mean anomaly 'M' is defined as :

$$M = L - W \quad [1-13]$$

$$\text{or} \quad M = L - F - w \quad [1-13a]$$

The mean daily orbital motion of planet 'n' is defined as :

$$n = 360 / P \quad [1-14]$$

At any time 't', the mean anomaly 'M(t)' of a planet may be calculated from :

$$M(t) = M_0 + n (t-t_0) \quad [1-15]$$

where 'M₀' is the mean anomaly at time 't₀'.

The orbital elements of the major planets in the solar system are available in the literature (Astronomical Almanac) or may be calculated (Meeus, 1982). In any case, the planet's eccentric anomaly 'E' and its true anomaly 'v' must be calculated as shown in equations [1-6] and [1-7]. For small values of 'e' (i.e. - e < 0.2), the eccentric anomaly can be calculated to an accuracy of 1 part in 100,000 in only five to ten iterations.

Next, the planet's radius vector 'r' (distance from the Sun in AU's) is found from :

$$r = a (1 - e \cos E) \quad [1-16]$$

The planet's argument of latitude is calculated from :

$$u = L + v - M - F \quad [1-17]$$

$$\text{or} \quad u = w + v \quad [1-17a]$$

The heliocentric ecliptic longitude 'l' and latitude 'b' of the planet are then :

$$l = \text{ArcTan} [\cos i \tan u] + F \quad [1-18]$$

$$b = \text{ArcSin} [\sin u \sin i] \quad [1-19]$$

With the heliocentric ecliptic coordinates calculated for the planet, the transformation to geocentric coordinates is straight forward. First, the intermediate quantities K1, K2 and K3 are calculated from :

$$K1 = r \cos b \sin(l-l_s) \quad [1-20]$$

$$K2 = r \cos b \cos(l-l_s) + R \quad [1-21]$$

$$K3 = r \sin b \quad [1-22]$$

where 'ls' is the Sun's geometric longitude [1-8]
and 'R' is the Sun's radius vector [1-9].

Then, the planet's geocentric distance 'd' (in AU's) is just :

$$d = \text{Sqrt}[K1**2 + K2**2 + K3**2] \quad [1-23]$$

The planet's geocentric ecliptic longitude 'lp' and latitude 'bp' are :

$$lp = \text{ArcTan}(K1/K2) + ls \quad [1-24]$$

$$bp = \text{ArcSin}[(r/d) \sin b] \quad [1-25]$$

The geocentric ecliptic longitude 'lp' and latitude 'bp' of the planet can now be converted to geocentric right ascension 'Rp' and declination 'Dp' by :

$$Rp = \text{ArcTan} (J1 / \cos lp) \quad [1-26]$$

$$\text{where : } J1 = \sin lp \cos o - \tan bp \sin o \quad [1-26a]$$

$$Dp = \text{ArcSin} J2 \quad [1-27]$$

$$\text{where : } J2 = \sin bp \cos o + \cos bp \sin o \sin lp \quad [1-27a]$$

TEN YEAR PLANETARY EPHEMERIS : 1986-1995

APPENDIX B : Program ORREY

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APPENDIX B : Program ORREY

Program ORREY is a simple planetary ephemeris program which is relatively short, fast and yields reasonably good accuracy for many applications. ORREY is capable of generating the geocentric coordinates for any solar system object including planets, asteroids and comets, provided that the orbital elements as defined in Appendix A are available. Since planetary perturbations cause the orbital elements of an object to vary with time, updated elements should be used for best results. Orbital elements for the planets can be found in the Astronomical Almanac for the current year.

When the epoch of the orbital elements is within six months of an ephemeris, the positional accuracy of the inner planets (Mercury, Venus and Mars) is half an arc-minute while the standard deviation of the major planets (Jupiter, Saturn, Uranus and Neptune) is 1 to 2 arc-minutes. If the epoch of the elements differs by five years from the ephemeris, the accuracy for the inner planets drops to 3 to 4 arc-minutes while the outer planet deviations are on the order of 4 to 8 arc-minutes. Program ORREY calculates the Sun's position to an accuracy of 15 arc-seconds over the period 1950 to 2050.

Written in FORTRAN, program ORREY consists of a main routine and seven subroutines : ORREY (Main), JULDAY, GETELM, PLANET, PLNTAB, ANGSEP, CALDAY and CNVRT4. A short description of each module follows.

1. ORREY - This is the main routine or driver. It handles the user's inputs for the desired date interval and frequency and it sets up a loop to calculate the planetary ephemerides over this period. It also controls calls to JULDAY, GETELM, PLANET and PLNTAB.
2. JULDAY - This routine calculates the decimal Julian date from the Gregorian or calendar date and Greenwich Mean Time.
3. GETELM - This routine reads the number of objects in the desired ephemeris as well as each object's physical characteristics and orbital elements. It also prints out a table of the orbital elements of each object in the catalog.
4. PLANET - This routine first calculates the geocentric coordinates of the Sun, its distance from Earth and its apparent angular diameter. Next, PLANET solves Kepler's equation and calculates the true anomaly, geocentric ecliptic coordinates and finally the geocentric celestial

coordinates of each object for the input Julian date. It also calculates the object's distance from the Sun and Earth, the apparent magnitude, apparent angular diameter, illumination phase and elongation from the Sun.

5. PLNTAB - This is an output routine which converts the date, time and celestial coordinates into a conventional format and prints an ephemeris table containing all objects for the given date and time. For each object, the table includes its name, the right ascension and declination, geocentric distance, apparent magnitude, apparent angular diameter, illumination phase and elongation from the Sun.
6. ANGSEP - This routine calculates the angular separation between any two pairs of coordinates on the celestial sphere. Subroutine PLANET calls ANGSEP to calculate the elongation of each object from the Sun.
7. CALDAY - This routine calculates the Gregorian or calendar date and Greenwich Mean Time from the decimal Julian Date. It performs the inverse function of routine JULDAY.
8. CNVRT4 - This routine converts a decimal time (angle) into hours, minutes and seconds (degrees, arc-minutes and arc-seconds). It is called by routine PLNTAB.

The user provides input to program ORREY from two logical units. On unit 20 (line 022 of ORREY), the user inputs the first and last Gregorian dates in the interval desired as well as the date increment (in days). For instance, if you wanted to calculate an ephemeris for April 1986 at two day intervals, you would enter :

4 1 1986 4 30 1986 2

using the format (2I3,I5,2I3,I5,I3).

A maximum of ten objects can be included in any ORREY ephemeris. The number of objects is input on logical unit 80 (line 013, subroutine GETELM). This sets up the index for a loop which reads in various physical parameters for each object and its orbital elements.

The physical parameters are defined as :

IM,ID,IY,IHR,IMIN - EPOCH OF ORBITAL ELEMENTS FOR PLANETS
OR PERIHELION PASSAGE FOR COMETS.
(MONTH,DAY,YEAR,HOUR,MINUTE)
EQ - EQUINOX OF ORBITAL ELEMENTS.
GMAG - APPARENT MAGNITUDE AT 1 AU.
PEX - POWER LAW EXPONENT FOR APPARENT MAGNITUDE.
DIAM - DIAMETER OF PLANET (KM).
NAME - NAME OF PLANET, ASTEROID OR COMET.

The physical elements are input with the following read and format statements (lines 25-27, subroutine GETELM) :

```
      READ(80,110) IM,ID,IY,IHR,IMIN,EQ(I),GMAG(I),PEX(I),DIAM(I),  
1          (NAME(J,I),J=1,2)  
110 FORMAT(I4,I3,I5,I3,I3,F8.2,2F6.2,F9.0,2X,2A4)
```

The orbital elements are defined as :

OMEGA - ARGUMENT OF PERIHELION.
ANOD - LONGITUDE OF THE ASCENDING NODE.
ANOM - MEAN ANOMALY.
ZINC - ORBITAL INCLINATION.
ECC - ECCENTRICITY OF ORBIT.
SMA - SEMI-MAJOR AXIS FOR ELLIPTICAL ORBIT.
DMU - MEAN MOTION (DEGREES/DAY).

Note that all angles are expressed in degrees.

The orbital elements are input with the following read and format statements (lines 37-39, subroutine GETELM) :

```
      READ(80,120) OMEGA(I),ANOD(I),ANOM(I),ZINC(I),ECC(I),SMA(I),  
1          DMU(I)  
120 FORMAT(4F9.4,2F9.5,F10.6)
```

Comments defining the physical parameters and orbital elements are also included in the code of subroutine GETELM.

As an example, suppose the user wants an ephemeris to include Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto and Comet Halley. That's a total of nine objects. The unit 80 input containing the number of objects, their planetary physical parameters and orbital elements might appear as follows :

```

          10          20          30          40          50          60
.....I.....I.....I.....I.....I.....I.....:
9
12 1 1985 0 0 1985.92 1.16 2.00 4878. MERCURY
29.0720 48.1643 1.7802 7.0045 0.20563 0.38710 4.092339
12 1 1985 0 0 1985.92 -4.00 2.00 12104. VENUS
54.8198 76.5531 88.2496 3.3945 0.00678 0.72333 1.602131
12 1 1985 0 0 1985.92 -1.30 2.00 6787. MARS
286.3510 49.4488 203.5632 1.8498 0.09339 1.52369 0.524033
12 1 1985 0 0 1985.92 -8.93 2.00 142800. JUPITER
275.116 100.3119 311.274 1.3052 0.04807 5.20252 0.083098
12 1 1985 0 0 1985.92 -8.68 2.00 120000. SATURN
338.730 113.551 145.486 2.4855 0.05149 9.55406 0.033380
12 1 1985 0 0 1985.92 -6.85 2.00 50800. URANUS
101.4500 73.9930 77.4170 0.7742 0.04630 19.26700 0.011654
12 1 1985 0 0 1985.92 -7.05 2.00 48600. NEPTUNE
290.6044 131.658 211.5411 1.7701 0.00858 30.05790 0.005980
12 1 1985 0 0 1985.92 -0.70 2.00 3000. PLUTO
114.194 110.218 354.122 17.1329 0.25039 39.5535 0.003962
2 9 1986 10 35 1986.14 5.50 4.44 5. HALLEY
111.8335 58.6362 0.0000 162.2368 0.96727 17.93874 0.012972
.....I.....I.....I.....I.....I.....I.....:
          10          20          30          40          50          60

```

Note that the above parameters and elements have been preceeded and succeeded by an alignment aid to identify the proper columns for the field of each variable.

An example of the output from program ORREY using the previous inputs is shown below :

EARTH EPHEMERIS FOR : 4/10/1986 0: 0.0 UT JD = 2446530.5

PLANET	RA	DEC	DELTA	MAG	SIZE	PHASE	ELONG
SUN	1 13.3	7 45.5	1.0018		31.93		
MERCURY	23 35.3	-4-30.2	0.8125	0.95	8.28	0.42	27.3
VENUS	2 28.5	14 24.0	1.5818	-3.59	10.55	0.94	-19.6
MARS	18 27.3	-23-40.6	0.9484	-0.23	9.87	0.89	103.6
JUPITER	22 51.8	-8-14.3	5.7524	-1.62	34.23	1.00	38.7
SATURN	16 31.8	-19-52.3	9.3058	1.16	17.78	1.00	130.5
URANUS	17 26.4	-23-17.7	18.6521	5.91	3.76	1.00	117.5
NEPTUNE	18 25.6	-22-13.3	30.0199	7.74	2.23	1.00	103.9
PLUTO	14 38.6	2 30.1	28.8062	13.96	0.14	1.00	156.4
HALLEY	15 24.2	-47-30.0	0.4185	4.94	0.02	0.91	131.5

Note that the diameter of the Sun listed in column SIZE is in arc-minutes while planet diameters are in arc-seconds.

APPENDIX B : Program ORREY

```

.....1.....2.....3.....4.....5.....6.....7
.....I.....I.....I.....I.....I.....I.....I.....

001 C****PROGRAM : ORREY
002 C****PROGRAM ORREY GENERATES PLANETARY EPHEMERIDES
003 C****FOR ANY PLANET, ASTEROID OR COMET IN THE SOLAR SYSTEM.
004 C****THE USER MUST INPUT THE DATE INTERVAL FOR THE EPHEMERIDES
005 C****AS WELL AS THE ORBITAL ELEMENTS FOR EACH PLANET.
006 C****WRITTEN BY F. ESPENAK - 9 AUGUST 1985.
007 C****LAST MODIFIED - 15 MAY 1986.
008 REAL*8 DJX,EJD,DJ1,DJ2
009 INTEGER*4 LAB(2)
010 COMMON/SUNBLK/RAS,DECS,ANGSOL,RAU
011 COMMON/PLANET/RA(10),DEC(10),AVEL(10),VMAG(10),ANGD(10),
012 1 PHASE(10),DEL(10),ELONG(10)
013 COMMON/ELMBLK/EJD(10),EQ(10),GMAG(10),PEX(10),DIAM(10),NAME(2,10),
014 1 ANOM(10),OMEGA(10),ANOD(10),ZINC(10),ECC(10),
015 2 DMU(10),SMA(10),TNU(10)
016 LAB(1)='EART'
017 LAB(2)='H '
018 C****READ :
019 C**** IM1,ID1,IY1 - INITIAL DATE OF EPHEMERIS PREDICTIONS.
020 C**** IM2,ID2,IY2 - FINAL DATE OF EPHEMERIS PREDICTIONS.
021 C**** IFD - DAY FREQUENCY OF EPHEMERIS PREDICTIONS.
022 READ(20,100) IM1,ID1,IY1,IM2,ID2,IY2,IFD
023 100 FORMAT(2I3,I5,2I3,I5,I3)
024 IF(IY1.EQ.0.OR.IY2.EQ.0) GO TO 99
025 IF(IFD.LE.0) IFD=1
026 STEP=FLOAT(IFD)
027 C****CALCULATE JULIAN DATES OF OBSERVING INTERVAL.
028 CALL JULDAY(DJ1,ID1,IM1,IY1,0,0,0.0)
029 CALL JULDAY(DJ2,ID2,IM2,IY2,0,0,0.0)
030 DJX=DJ1
031 C****READ IN ORBITAL ELEMENTS AND PLANET CHARACTERISTICS.
032 CALL GETELM(NO)
033 C****CALCULATE EPHEMERIS FOR EACH PLANET.
034 10 CALL PLANET(DJX,NO)
035 C****GENERATE PLANETARY EPHEMERIS OUTPUT TABLE.
036 CALL PLNTAB(DJX,NO,LAB)
037 C****INCREMENT DATE.
038 DJX=DJX+STEP
039 IF(DJX.LT.DJ2) GO TO 10
040 C****EXIT PROGRAM ORREY.
041 99 STOP
042 END

```

```

.....1.....2.....3.....4.....5.....6.....7
.....I.....I.....I.....I.....I.....I.....I.....

```

APPENDIX B : Program ORREY

```

.....1.....2.....3.....4.....5.....6.....7
.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....

001      SUBROUTINE GETELM(NO)
002 C****SUBROUTINE GETELM READS IN ORBITAL ELEMENTS FOR
003 C****PLANETS, ASTEROIDS, COMETS, SPACECRAFT, ETC..
004 C****WRITTEN BY F. ESPENAK - 6 NOVEMBER 1985.
005 C****LAST MODIFIED - 15 MAY 1986.
006      REAL*8 EJD
007      REAL*4 PERD(10)
008      COMMON/ELMBLK/EJD(10),EQ(10),GMAG(10),PEX(10),DIAM(10),NAME(2,10),
009      1      ANOM(10),OMEGA(10),ANOD(10),ZINC(10),ECC(10),
010      2      DMU(10),SMA(10),TNU(10)
011 C****READ IN NUMBER OF PLANETS IN DATA FILE.
012 C****      NO - NUMBER OF 'PLANETS' IN INPUT FILE.
013      READ(80,100) NO
014      100 FORMAT(I5)
015      DO 600 I=1,NO
016 C****READ IN PLANET CHARACTERISTICS RECORD.
017 C****      IM,ID,IY,IHR,IMIN - EPOCH OF ORBITAL ELEMENTS FOR PLANETS
018 C****      OR PERIHELION PASSAGE FOR COMETS.
019 C****      (MONTH,DAY,YEAR,HOUR,MINUTE)
020 C****      EQ - EQUINOX OF ORBITAL ELEMENTS.
021 C****      GMAG - APPARENT MAGNITUDE AT 1 AU.
022 C****      PEX - POWER LAW EXPONENT FOR APPARENT MAGNITUDE.
023 C****      DIAM - DIAMETER OF PLANET (KM).
024 C****      NAME - NAME OF PLANET, ASTEROID OR COMET.
025      READ(80,110) IM,ID,IY,IHR,IMIN,EQ(I),GMAG(I),PEX(I),DIAM(I),
026      1      (NAME(J,I),J=1,2)
027      110 FORMAT(I4,I3,I5,I3,I3,F8.2,2F6.2,F9.0,2X,2A4)
028 C****READ IN ORBITAL ELEMENTS OF PLANET.
029 C****      OMEGA - ARGUMENT OF PERIHELION.
030 C****      ANOD - LONGITUDE OF THE ASCENDING NODE.
031 C****      ANOM - MEAN ANOMALY.
032 C****      ZINC - ORBITAL INCLINATION.
033 C****      ECC - ECCENTRICITY OF ORBIT.
034 C****      SMA - SEMI-MAJOR AXIS FOR ELLIPTICAL ORBIT.
035 C****      DMU - MEAN MOTION (DEGREES/DAY).
036 C****NOTE : ALL ANGLES ARE EXPRESSED IN DEGREES.
037      READ(80,120) OMEGA(I),ANOD(I),ANOM(I),ZINC(I),ECC(I),SMA(I),
038      1      DMU(I)
039      120 FORMAT(4F9.4,2F9.5,F10.6)
040      CALL JULDAY(EJD(I),ID,IM,IY,IHR,IMIN,0.0)

.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....
      1      2      3      4      5      6      7

```


APPENDIX B : Program ORREY

	1	2	3	4	5	6	7
	.....I.....	I.....	I.....	I.....	I.....	I.....	I.....

```

041      IF(SMA(I).LT.0.0) SMA(I)=ABS(SMA(I))/(1.0-ECC(I))
042      IF(ECC(I).LT.1.0) PERD(I)=SMA(I)**1.5
043      IF(DMU(I).LE.0.0.AND.ECC(I).LT.1.0)
044      1      DMU(I)=360.0/(365.25636*PERD(I))
045      600 CONTINUE
046  C****PRINT ORBITAL ELEMENTS TABLE.
047      WRITE(10,200) IM,ID,IY,IHR,IMIN
048      200 FORMAT(1H1///10X,'ORBITAL ELEMENTS FOR : ',I3,'/',I2,'/',I4,
049      1 5X,'UT =',I3,':',I2/// 5X,'PLANET',10X,'I',
050      2 8X,'A NODE',7X,'OMEGA',9X,'A',11X,'E',
051      3 12X,'P',10X,'M'//)
052      DO 610 I=1,NO
053      WRITE(10,210) (NAME(J,I),J=1,2),ZINC(I),ANOD(I),OMEGA(I),
054      1      SMA(I),ECC(I),PERD(I),ANOM(I)
055      210 FORMAT(5X,2A4,9F12.5)
056      610 CONTINUE
057      WRITE(10,201)
058      201 FORMAT(1H1/)
059  C****EXIT SUBROUTINE GETELM.
060      99 RETURN
061      END

```

.....I.....	I.....	I.....	I.....	I.....	I.....	I.....	I.....
1	2	3	4	5	6	7	

APPENDIX B : Program ORREY

.....1.....2.....3.....4.....5.....6.....7.....
I.....I.....I.....I.....I.....I.....I.....

```

001      SUBROUTINE PLANET(DJX,NO)
002 C****SUBROUTINE PLANET CALCULATES THE GEOCENTRIC COORDINATES OF
003 C****A PLANET, ASTEROID OR COMET, GIVEN ITS ORBITAL ELEMENTS.
004 C****BASED ON "ASTRONOMICAL FORMULAE FOR CALCULATORS" BY MEEUS.
005 C****WRITTEN BY F. ESPENAK - 9 AUGUST 1985.
006 C****LAST MODIFIED - 9 DECEMBER 1985.
007      REAL*4 T,GAMMA,GMEAN,AN,EAN,TRIAL,TANOM,GLAM
008      REAL*4 COB,COS,DAYS,ANOML,CB,OBAR,U,V,EL,B,ZLAM,BETA,RO,DO
009      REAL*8 DJX,EJD
010      COMMON/SUNBLK/RAS,DECS,ANGSOL,RAU
011      COMMON/PLANET/RA(10),DEC(10),AVEL(10),VMAG(10),ANGD(10),
012 1      PHASE(10),DEL(10),ELONG(10),RD(10)
013      COMMON/ELMBLK/EJD(10),EQ(10),AMAG(10),PEX(10),DIAM(10),NAME(2,10),
014 1      ANOM(10),OMEGA(10),ANOD(10),ZINC(10),ECC(10),
015 2      DMU(10),SMA(10),TNU(10)
016      COMMON/RECBK/XS,YS,ZS,X(10),Y(10),Z(10)
017      DATA DTR/0.017453293/
018      DATA RTD/57.2957795/
019      DATA TPI/6.2831853/
020      DATA CA/1.216372E-02/
021      DATA AU/1.495979E+08/
022      DATA EPS/23.44124/
023      DATA E/0.01671542/
024      DATA ELIM/1.0E-06/
025 C****CALCULATE TIME ELAPSED IN JULIAN CENTURIES SINCE 0.5 JAN 1900
026 C****AND UPDATE THE EARTH'S ORBITAL ELEMENTS.
027      T=(DJX-2415020.0)/36525.0
028      GAMMA=281.220844+1.719175*T
029      GMEAN=358.475833+35999.049750*T
030      GMEAN=AMOD(GMEAN,360.)
031      AN=GMEAN*DTR
032 C****DETERMINE EARTH'S ECCENTRIC ANOMALY 'EAN' USING ITERATIVE SOLUTION
033 C****AND THEN CALCULATE THE TRUE ANOMALY 'TANOM' AND
034 C****SOLAR RADIUS VECTOR 'RAU' IN ASTRONOMICAL UNITS.
035      EAN=AN
036 5      TRIAL=EAN
037      EAN=AN+E*SIN(TRIAL)
038      IF (ABS(EAN-TRIAL).GT.ELIM) GO TO 5
039      TANOM=SQRT((1.0+E)/(1.0-E))*TAN(0.5*EAN)
040      TANOM=2.0*ATAN(TANOM)

```

.....1.....2.....3.....4.....5.....6.....7.....
I.....I.....I.....I.....I.....I.....I.....

APPENDIX B : Program ORREY

```

          1          2          3          4          5          6          7
.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I...

041      RAU=1.0000002*(1.0-E*E)/(1.0+E*COS(TANOM))
042 C****CALCULATE THE SUN'S APPARENT DIAMETER.
043      ANGSOL=1.392E+06/(1.496E+08*RAU)
044      ANGSOL=60.0*RTD*ASIN(ANGSOL)
045 C****CALCULATE THE SUN'S GEOMETRIC LONGITUDE, MEAN EQUINOX OF DATE.
046      GLAM=TANOM+DTR*GAMMA-DTR*20.47/(RAU*3600.)
047 C****CALCULATE THE SUN'S MEAN GEOCENTRIC RECTANGULAR COORDINATES.
048      EPSR=DTR*EPS
049      XS=COS(GLAM)
050      YS=SIN(GLAM)*COS(EPSR)
051      ZS=SIN(GLAM)*SIN(EPSR)
052 C****CONVERT RECTANGULAR COORDINATES TO RIGHT ASCENSION AND DECLINATION.
053      RAS=ATAN2(YS,XS)
054      IF(RAS.LT.0.0) THEN
055      RAS=RAS+TPI
056      END IF
057      DECS=ASIN(ZS)
058      RAS=RTD*RAS/15.
059      DECS=RTD*DECS
060 C****INITIATE LOOP TO CALCULATE PLANETARY EPHEMERIDES.
061      DO 600 I=1,N0
062      KNT=0
063      DAYS=DJX-EJD(I)
064 C****DETERMINE THE ECCENTRIC ANOMALY 'EAN' USING ITERATIVE SOLUTION
065 C****AND THEN CALCULATE THE TRUE ANOMALY 'TANOM' AND
066 C****RADIUS VECTOR 'RD' FOR AN ELLIPTICAL ORBIT.
067      IF(ECC(I).LT.1.0) THEN
068      ANOML=AMOD((ANOM(I)+DMU(I)*DAYS),360.)
069      AN=ANOML*DTR
070      EAN=AN
071      10 TRIAL=EAN
072      IF(ECC(I).LT.0.4) THEN
073      EAN=AN+ECC(I)*SIN(TRIAL)
074      ELSE
075      EAN=TRIAL+(AN+ECC(I)*SIN(TRIAL)-TRIAL)/(1.0-ECC(I)*COS(TRIAL))
076      END IF
077      KNT=KNT+1
078      IF(ABS(EAN-TRIAL).GT.ELIM) GO TO 10
079      TANOM=2.0*ATAN(SQRT((1.0+ECC(I))/(1.0-ECC(I))))*TAN(0.5*EAN)
080      RD(I)=SMA(I)*(1.-ECC(I)*ECC(I))/(1.+ECC(I)*COS(TANOM))

.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I...
          1          2          3          4          5          6          7

```

APPENDIX B : Program ORREY

```

.....1.....2.....3.....4.....5.....6.....7
.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I...

081      ELSE
082 C****DETERMINE THE ECCENTRIC ANOMALY 'EAN' USING ITERATIVE SOLUTION
083 C****AND THEN CALCULATE THE TRUE ANOMALY 'TANOM' AND
084 C****RADIUS VECTOR 'RD' FOR A PARABOLIC ORBIT.
085 C****(FROM "ASTRONOMICAL FORMULAE FOR CALCULATORS", MEEUS, PAGE 133)
086      CB=CA*DAY/ SMA(I)**1.5
087      TANOM=1.0
088      20 TRIAL=TANOM
089      TANOM=(CB+0.6666667*TRIAL**3)/(1.0+TRIAL*TRIAL)
090      IF (ABS(TANOM-TRIAL).GT.ELIM) GO TO 20
091      TANOM=2.0*ATAN(TANOM)
092      RD(I)=SMA(I)/(COS(0.5*TANOM))**2
093      END IF
094      TNU(I)=TANOM
095 C****CALCULATE HELIOCENTRIC ECLIPTIC LONGITUDE AND LATITUDE.
096      OBAR=TANOM+DTR*OMEGA(I)
097      U=COS(DTR*ZINC(I))*SIN(OBAR)
098      V=COS(OBAR)
099      EL=ATAN2(U,V)+DTR*ANOD(I)
100      B=SIN(OBAR)*SIN(DTR*ZINC(I))
101      B=ASIN(B)
102 C****CALCULATE THE DISTANCE 'DEL' BETWEEN EARTH AND PLANET IN A.U.
103      DEL(I)=2*RAU*RD(I)*COS(B)*COS(EL-GLAM)
104      DEL(I)=SQRT(DEL(I)+RAU*RAU+RD(I)*RD(I))
105 C****CALCULATE GEOCENTRIC ECLIPTIC LONGITUDE AND LATITUDE.
106      U=RD(I)*COS(B)*SIN(EL-GLAM)
107      V=RD(I)*COS(B)*COS(EL-GLAM)+RAU
108      ZLAM=ATAN2(U,V)+GLAM
109      BETA=RD(I)*SIN(B)/DEL(I)
110      BETA=ASIN(BETA)
111 C****CONVERT RECTANGULAR COORDINATES TO RIGHT ASCENSION AND DECLINATION.
112      U=SIN(ZLAM)*COS(EPSR)-TAN(BETA)*SIN(EPSR)
113      V=COS(ZLAM)
114      RO=ATAN2(U,V)
115      IF(RO.LT.0.0) THEN
116      RO=RO+TPI
117      END IF
118      DO=SIN(BETA)*COS(EPSR)+COS(BETA)*SIN(EPSR)*SIN(ZLAM)
119      DO=ASIN(DO)
120      RA(I)=RTD*RO/15.DO

.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I.....:.....I...
      1          2          3          4          5          6          7

```

APPENDIX B : Program ORREY

	1	2	3	4	5	6	7
	.....I.....	I.....	I.....	I.....	I.....	I.....	I.....

```

121      DEC(I)=RTD*DO
122 C****CALCULATE APPARENT ANGULAR DIAMETER.
123      ANGDI(I)=3600.*RTD*ASIN(DIAM(I)/(AU*DEL(I)))
124 C****CALCULATE ELONGATION OF PLANET FROM SUN.
125      ELONG(I)=ANGSEP(RAS,DECS,RA(I),DEC(I))
126 C****CALCULATE ILLUMINATED PHASE AND APPARENT MAGNITUDE.
127      ANGE=ABS(DTR*ELONG(I))
128      COSI=(DEL(I)-RAU*COS(ANGE))/RD(I)
129      PHASE(I)=ABS(0.5*(1.0+COSI))
130      VMAG(I)=AMAG(I)+5.0*ALOG10(DEL(I))+2.5*PEX(I)*ALOG10(RD(I))
131      IF(PEX(I).EQ.2.0) THEN
132      VMAG(I)=VMAG(I)-5.0*LOG10(PHASE(I))
133      END IF
134      600 CONTINUE
135 C****EXIT SUBROUTINE PLANET.
136      99 RETURN
137      END

```

.....I.....	I.....	I.....	I.....	I.....	I.....	I.....	I.....
1	2	3	4	5	6	7	

APPENDIX B : Program ORREY

.....1.....2.....3.....4.....5.....6.....7.....
I.....I.....I.....I.....I.....I.....I.....

```

001      SUBROUTINE PLNTAB(DJX,NO,LAB)
002 C****SUBROUTINE PLNTAB PRINTS A PLANETARY EPHEMERIS TABLE.
003 C****WRITTEN BY F. ESPENAK - 6 NOVEMBER 1985.
004 C****LAST MODIFIED - 16 MAY 1986.
005      REAL*4 ALBEDO(10),PERD(10),LAB(2)
006      REAL*8 DJX,EJD,DJ1,DJ2
007      COMMON/SUNBLK/RAS,DECS,ANGSOL,RAU
008      COMMON/PLANET/RA(10),DEC(10),AVEL(10),VMAG(10),ANGD(10),
009      1      PHASE(10),DEL(10),ELONG(10)
010      COMMON/ELMBLK/EJD(10),EQ(10),GMAG(10),PEX(10),DIAM(10),NAME(2,10),
011      1      ANOM(10),OMEGA(10),ANOD(10),ZINC(10),ECC(10),
012      2      DMU(10),SMA(10),TNU(10)
013 C****GENERATE PLANETARY EPHEMERIS OUTPUT TABLE.
014      CALL CALDAY(DJX,ID,IM,IY,IGDAY,AHR,AMIN,ASEC,IHR,IMIN,ISEC)
015      EPOCH=FLOAT(IY)+FLOAT(IGDAY)/365.25
016      WRITE(10,200) LAB(1),LAB(2),IM,ID,IY,IHR,AMIN,DJX
017      WRITE(6,200) LAB(1),LAB(2),IM,ID,IY,IHR,AMIN,DJX
018      200 FORMAT(///1X,2A4,' EPHEMERIS FOR :',I4,'/',I2,'/',I4,
019      1 4X,I3,':',F4.1,' UT',4X,'JD =',F10.1///
020      2 1X,'PLANET', 6X,'RA',8X,'DEC',
021      3 8X,'DELTA',5X,'MAG',4X,'SIZE',3X,'PHASE',3X,'ELONG'/)
022      CALL CNVRT4(RAS,RA2,RA3,IRA1,IRA2,IRA3,IDUM)
023      CALL CNVRT4(DECS,DEC2,DEC3,ID1,ID2,ID3,IDUM)
024      WRITE(10,205) IRA1,RA2,ID1,DEC2,RAU,ANGSOL
025      WRITE(6,205) IRA1,RA2,ID1,DEC2,RAU,ANGSOL
026      205 FORMAT(1X,'SUN',5X,2(I4,F5.1,1X),F10.4,8X,F8.2)
027      DO 620 I=1,NO
028      CALL CNVRT4(RA(I),RA2,RA3,IRA1,IRA2,IRA3,IDUM)
029      CALL CNVRT4(DEC(I),DEC2,DEC3,ID1,ID2,ID3,IDUM)
030      WRITE(10,210) (NAME(J,I),J=1,2),IRA1,RA2,ID1,DEC2,
031      1      DEL(I),VMAG(I),ANGD(I),PHASE(I),ELONG(I)
032      WRITE( 6,210) (NAME(J,I),J=1,2),IRA1,RA2,ID1,DEC2,
033      1      DEL(I),VMAG(I),ANGD(I),PHASE(I),ELONG(I)
034      210 FORMAT(1X,2A4,2(I4,F5.1,1X),F10.4,F8.2,F8.2,F8.2,F8.1)
035      620 CONTINUE
036 C****EXIT SUBROUTINE PLNTAB.
037      99 RETURN
038      END

```

.....1.....2.....3.....4.....5.....6.....7.....
I.....I.....I.....I.....I.....I.....I.....

APPENDIX B : Program ORREY

```

          1          2          3          4          5          6          7
.....I.....I.....I.....I.....I.....I.....I...

001      SUBROUTINE JULDAY(FJD,ID,IM,IY,IHOUR,IMIN,SEC)
002      C****SUBROUTINE JULDAY COMPUTES THE JULIAN DECIMAL DATE (FJD) FROM
003      C****THE CALENDER DATE (ID,IM,IY) AND TIME (IHOUR,IMIN,SEC).
004      C****MODIFIED BY F. ESPENAK - AUGUST 1978.
005          REAL*8 FJD
006          NDAY= ID-32075+1461*(IY+4800+(IM-14)/12)/4+367*(IM-2-(IM-14)/12
007      1      *12)/12-3*((IY+4900+(IM-14)/12)/100)/4
008          FJD= DFLOAT(NDAY)-.5D0+IHOUR/24.D0+IMIN/1440.D0+SEC/86400.D0
009          RETURN
010          END

```

```

          1          2          3          4          5          6          7
.....I.....I.....I.....I.....I.....I.....I...

001      FUNCTION ANGSEP(RA1,DEC1,RA2,DEC2)
002      C****FUNCTION ANGSEP CALCULATES THE ANGULAR SEPARATION BETWEEN TWO
003      C****POINTS ON THE CELESTIAL SPHERE.
004      C****NOTE : INPUT ARGUEMENTS ARE IN DECIMAL HOURS AND DEGREES.
005      C****WRITTEN BY F. ESPENAK - AUGUST 1977.
006      C****LAST MODIFIED BY F. ESPENAK - 14 AUGUST 1985.
007          DATA DTR/0.017453293/
008          DATA RTD/57.2957795/
009          DATA PI/3.14159265/
010          D1=DTR*DEC1
011          D2=DTR*DEC2
012          DELRA=15.*DTR*(RA1-RA2)
013      C****CALCULATE ANGULAR SEPARATION.
014          CEL=SIN(D1)*SIN(D2)+COS(D1)*COS(D2)*COS(DELRA)
015          IF(ABS(CEL).GE.1.0) CEL=0.9999
016          ANGSEP=ACOS(CEL)
017          IF(DELRA.LT.0.0.AND.DELRA.GE.-PI) ANGSEP=-ANGSEP
018          IF(DELRA.GT.PI) ANGSEP=-ANGSEP
019          ANGSEP=RTD*ANGSEP
020          RETURN
021          END

```

```

.....I.....I.....I.....I.....I.....I.....I...
          1          2          3          4          5          6          7

```

APPENDIX B : Program ORREY

.....1.....2.....3.....4.....5.....6.....7.....
I.....I.....I.....I.....I.....I.....I.....

```

001      SUBROUTINE CALDAY(FJD,ID,IM,IY,NDAY,AHR,AMIN,ASEC,IHR,IMIN,ISEC)
002 C****SUBROUTINE CALDAY CALCULATES THE GREGORIAN CALENDAR DATE (ID,IM,IY)
003 C****THE DAY OF YEAR (NDAY), AND TIME (AHR,AMIN,ASEC,IHR,IMIN,ISEC)
004 C****FROM THE DECIMAL JULIAN DATE (FJD).
005 C****MODIFIED BY F. ESPENAK - AUGUST 1978.
006 C****LAST MODIFIED - 6 JUNE 1986.
007      INTEGER*4 MONTH(12)
008      REAL*8 FJD,ADIF,AHR,AMIN,ASEC
009      DATA MONTH/0,31,59,90,120,151,181,212,243,273,304,334/
010 C****CALCULATE GREGORIAN CALENDAR DATE.
011      JD=FJD+0.5
012      L=JD+68569
013      N=4*L/146097
014      L=L-(146097*N+3)/4
015      IY=4000*(L+1)/1461001
016      L=L-1461*IY/4+31
017      IM=80*L/2447
018      ID=L-2447*IM/80
019      L=IM/11
020      IM=IM+2-12*L
021      IY=100*(N-49)+IY+L
022      NDAY=MONTH(IM)+ID
023      IF (IM.GT.2.AND.(IY-IY/4*4).EQ.0) NDAY=NDAY+1
024 C****CALCULATE TIME.
025      ADIF=FJD+0.5-JD
026      AHR=ADIF*24.
027      IHR=AHR
028      AMIN=(AHR-IHR)*60.
029      IMIN=AMIN
030      ASEC=(AMIN-IMIN)*60.
031      ISEC=ASEC
032      RETURN
033      END

```

.....1.....2.....3.....4.....5.....6.....7.....
I.....I.....I.....I.....I.....I.....I.....

APPENDIX B : Program ORREY

	1	2	3	4	5	6	7
	.....I.....	I.....	I.....	I.....	I.....	I.....	I.....
001	SUBROUTINE CNVRT4(XA,XB,XC,IA,IB,IC,ID)						
002	C****SUBROUTINE CNVRT4 CONVERTS DECIMAL TIME INTO HOURS, MINUTES,						
003	C****SECONDS AND MILLISECONDS (IA,IB,IC,ID).						
004	C****NOTE : CNVRT4 IS A SINGLE PRECISION VERSION OF CNVRT.						
005	C****WRITTEN BY F. ESPENAK - SEPTEMBER 1978.						
006	IA=INT(XA)						
007	XB=60.0*(XA-IA)						
008	IB=INT(XB)						
009	XC=60.0*(XB-IB)						
010	IC=INT(XC)						
011	ID=INT(1000.0*(XC-IC))						
012	RETURN						
013	END						
I.....	I.....	I.....	I.....	I.....	I.....	I.....
	1	2	3	4	5	6	7

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